The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 110, NO. 12 — COPYRIGHT, 1938, BY AMERICAN MEDICAL ASSOCIATION CHICAGO, ILLINOIS — MARCH 19, 1938

DOES DIGITALIS INFLUENCE THE COURSE OF CARDIAC PAIN?

A STUDY OF 120 SELECTED CASES OF ANGINA PECTORIS

HARRY GOLD, M.D.; HAROLD OTTO, M.D.
NATHANIEL T. KWIT, M.D.
AND
HARRY SATCHWELL, M.D.
NEW YORK

In accordance with the prevailing view that cardiac pain results chiefly from relative cardiac ischemia, any one or a combination of several primary changes in cardiovascular dynamics may be considered competent either to produce or to relieve this symptom in patients with angina pectoris, such as changes in heart rate or rhythm, systemic blood pressure, return flow, stroke volume, minute volume, and size of the coronary bed. The influence of the digitalis bodies on the foregoing functions is variable, and from the extensive pharmacologic literature observations may be assembled in the support of divergent possibilities; namely, that pain is uninfluenced, that it is increased or that it is diminished by members of this group of drugs.

The experimental results which appear to have exerted a strong influence on clinical views are those which indicate that digitalis may directly constrict the coronary arteries. It is stated that through this action [1] digitalis may increase the pain in patients suffering with attacks of angina pectoris, although some investigators have failed to find sufficient basis for such a belief [2] and others have found that the glucosides increase coronary flow.[3] The clinical literature on the subject consists, for the most part, of isolated observations [4] and general impressions. A more extensive report was published by Fenn and Gilbert,[5] which also provides a review of the literature. They presented an account of the case histories of seven patients as representative of others in their experience, from which they concluded that digitalis produces anginal pain and is particularly liable to do this in patients with angina pectoris. Their conclusion was derived, in some of these cases, from the fact that during a course of digitalis pain appeared or was increased and, in other cases, from the fact that this phenomenon could be reproduced during more than one trial. In view of the capricious behavior of cardiac pain during treatment by various agents, as we have had occasion to learn in a previous study [6] on the effect of the xanthines on this symptom, such observations, we believe, can be considered suggestive but as evidence are too weak to support the belief that digitalis in therapeutic doses is particularly liable to provoke pain in persons with angina pectoris by a specific action on the heart or blood vessels.

Accordingly, an investigation was undertaken to secure evidence on the question of whether digitalis exerts any influence on the course of pain in patients with angina pectoris, and this report presents the results.

SELECTION OF PATIENTS

The subjects were 120 ambulant patients in attendance at the cardiac clinic, for whom the diagnosis of arteriosclerotic heart disease with cardiac pain was made, in accordance with the nomenclature and criteria adopted by the New York Heart Association.[7] The study was conducted during a period of seven years. The duration of observations in any given case varied from two to sixty-four months, the average being twenty-one months.

Some of the characteristics of the whole group are listed in table 1. They were selected from a total case load of approximately 1,000 patients, representing an average sample of the cardiac clinic population, comprising several racial groups, both native and foreign born. The majority were without occupation. None of these patients had signs of congestive heart failure. Only patients with pain on effort were studied, and although some patients with true cardiac pain were excluded by the restriction, this measure served to insure against the inclusion of patients in whom the thoracic pain might be of noncardiac origin.

The severity of the pain varied greatly, from mild substernal pressure or discomfort induced by moderate effort, only slightly interfering with the patient's ability to carry on (1 +), to excruciating pain induced by the slightest effort, occurring also when the patient was at rest, so as to cause almost complete incapacity (3 +).

Faithful assistance was rendered throughout the course of this study by Miss Ida Wolfson, volunteer to the cardiac clinics.

From the Department of Pharmacology of Cornell University Medical College and the Cardiac Clinics of the Hospital for Joint Diseases and the Beth Israel Hospital.

1. Voegtlin, Carl, and Macht, David: The Action of Nitrites and Drugs of the Digitalis Group on the Isolated Coronary Artery, J. Pharmacol. & Exper. Therap. **5**: 77, 1913. Gilbert, N. C., and Fenn, G. K.: Effect of Digitalis on the Coronary Flow, Arch. Int. Med. **50**: 668 (Nov.) 1932.

2. Bond, G. S.: Effect of Various Agents on the Blood Flow Through the Coronary Arteries and Veins, J. Exper. Med. **12**: 575, 1910. Eggleston, Cary: Some Newer Concepts in Digitalis Therapy, Am. J. M. Sc. **160**: 585, 1920. Cushny, A. R.: Digitalis and Its Allies, New York, Longmans, Green & Co., 1925.

3. Meyer, F.: Ueber die Wirkung verschiedener Arzneimittel auf die Coronargefässe des lebenden Tieres, Arch. f. Physiol. 1912, p. 223. Bodo, R.: The Effect of Heart Tonics and Other Drugs upon the Heart Tone and Coronary Circulation, J. Physiol. **64**: 365 (Feb.) 1928.

4. Stewart, H. J., and Cohn, A. E.: Studies on the Effect of the Action of Digitalis on the Output of Blood from the Heart, J. Clin. Investigation **11**: 917 (Sept.) 1932. Luten, Drew: The Clinical Use of Digitalis, Springfield, Ill., Charles C. Thomas, Publisher, 1936.

5. Fenn, G. K., and Gilbert, N. C.: Anginal Pain as a Result of Digitalis Administration, J. A. M. A. **98**: 99 (Jan. 9) 1932.

6. Gold, Harry, Kwit, N. T., and Otto, Harold: The Xanthines (Theobromine and Aminophylline) in the Treatment of Cardiac Pain, J. A. M. A. **108**: 2173 (June 26) 1937.

7. Criteria for the Classification and Diagnosis of Heart Disease.

Careful questioning of the patient at every visit to the clinic made it possible to exclude the cases in which there was reason to believe that cooperation in the uninterrupted use of whatever drug was issued and in the accurate reporting of any omissions was not sufficiently faithful for the purpose of this study.

TABLE 1.—*Classification of 120 Patients with Arteriosclerotic Heart Disease and Cardiac Pain*

Average age	57.6 years
Age range	40-82 years
Number of males	103
Number of females	17
Number with hypertension (28 males, 10 females)	38
Number with electrocardiographic changes indicating myocardial damage	64
Number with coronary thrombosis (42 males, 4 females)	46
Classification of pain based on severity, duration and frequency of attacks, and degree of physical limitation:	
Slight (1+)	16
Moderate (2+)	54
Severe (3+)	50
Occupation:	
Number not working	98
Number working (11 women doing limited housework; 3 men engaged in light part time work; 8 men engaged in light full time work)	22
Range of periods of study	2-64 months
Average period of study	21.7 months
Range of number of courses with digitalis	1-7
Average number of courses with digitalis	2.02
Total number of courses with digitalis	243
Range of duration of courses with digitalis	1-68 weeks
Average duration of courses with digitalis	11.1 weeks

DRUGS AND OTHER TREATMENT

Most of the patients had been in attendance at the clinic a long time when the study was started, and many of them were already subject to restrictions in diet and effort. No further advice was given for modification of habits or activities.

The dried digitalis leaf was administered in compressed tablets of 1, 2 or 3 cat units each.[8] The daily quantity was given in a single dose. A tincture of digitalis was also given in a few cases in which observations suggested the need of the same drug in a different form. The general plan was to start with a moderate daily dose of 2 cat units (0.2 Gm.), increasing the dose after one week to 4 (0.4 Gm.) and then to 6 cat units (0.6 Gm.) unless minor toxic symptoms appeared. The highest daily dose was 2 cat units in 3.4 per cent of the cases, 3 cat units in 5 per cent of the cases, 4 cat units in 54.1 per cent of the cases and 6 cat units in 37.5 per cent of the cases. Minor toxic symptoms, nausea, vomiting or heart block, were produced in forty-six cases (38.3 per cent).

The digitalis was given in courses lasting from one to sixty-eight weeks, the average lasting eleven weeks. Some patients received as many as seven courses; the average was two courses for each patient. Several courses of treatment with digitalis and the placebo were carried through, especially in the cases in which obvious factors that might vitiate a valid comparison existed, such as change of diet, weather or work. In all, 243 courses of treatment with digitalis were given. These were frequently alternated with periods in which the patient received various agents as controls, such as sodium salicylate, acetylsalicylic acid, calomel, cascara, mixture of rhubarb and soda, phenobarbital, codeine or a xanthine. In each case a comparison was made of the effect of the digitalis with that of lactose.

8. The specimen supplied by the New York Heart Association was used in the case of the tablets; its potency was 80 mg. per cat unit.

METHOD OF SECURING DATA

The method of securing the data was similar to that used in a previous study [6] on the effect of the xanthines on cardiac pain. The details of the method, the sources of error and the means (the "blind test") employed for guarding against errors are described in that paper. Briefly, the data consisted of the patient's judgments as to whether, during a given period, the cardiac pain had remained unchanged, had increased or had diminished, the severity and frequency of attacks and the capacity for effort without pain being taken into account. The point of reference was the patient's habitual status.

The data (changes in pain) thus obtained were charted, and the charts were used in the study of the question of cause and effect. It was not deemed safe to attempt to assign a cause for all the changes in pain, since diverse factors usually coexist in such cases, which might be responsible for changes in cardiac pain during the use of a drug. The assurance with which patients often ascribed the production as well as the relief of pain to a placebo tablet rendered their convictions unreliable as a means of establishing these relationships. It was assumed that if digitalis significantly increased or diminished cardiac pain, such a record of the facts as we obtained should reveal it. The presence or absence of unequivocal differences in the appearance of the charts between periods in which the patient used a placebo and those in which he used digitalis would therefore provide the evidence concerning a causal relation. In cases in which such differences did appear with digitalis in the form in which it was first used, its form, color and taste were subsequently disguised in such a manner as to preclude its detection by the patient through any means other than the influence on pain. The validity of the controls was enhanced by the fact that the duration of the courses with the control agents and with digitalis were fairly long and that the patient received repeated courses of each, often in different seasons of the year and under other conditions as nearly comparable as possible.

RESULTS

The data on changes in pain during the first period of treatment with a placebo were compared with those during a period in which digitalis was used. This period represented from one to several weeks in the case of each. As may be seen in table 2, in 45 per cent of the patients a change took place; 30 per cent reported diminished pain and 15 per cent increased pain during the use of digitalis. However, during the first period of treatment with an inert tablet of lactose, 28.3 per cent of the patients reported a departure from their habitual status; 15 per cent reported increased pain and 13.3 per cent decreased pain.

TABLE 2.—*Comparison of Changes in Pain During First Period of Treatment*

	Digitalis		Placebo	
Number of Patients	Number	Percentage	Number	Percentage
Pain unchanged	66	55	86	71.7
Pain diminished	36	30	16	13.3
Pain increased	18	15	18	15
	120		120	

Whether digitalis by its specific systemic action is responsible for the changes in pain can be learned only

from a study of the complete charts of the individual cases, showing the changes of pain during periods of various control agents alternated with periods of digitalis. In these charts the intensity of the pain as compared with the habitual status was graded, and three grades in each direction were considered: increase or decrease of pain, slight, moderate or marked. It is feasible to present the charts of only a few of the cases to illustrate the manner in which the study was pursued and the type of results which served as a basis for conclusions regarding the influence of digitalis on the course of cardiac pain.

As in the case of a previous study,[6] the charts of the 120 cases fell into four types:

(*a*) Those in which the habitual status remained constant and apparently uninfluenced by any drug that was used (10 per cent).

(*b*) Those in which temporary departures from the habitual status were always in the direction of increased pain (3.3 per cent).

(*c*) Those in which temporary departures were always in the direction of improvement (20 per cent).

(*d*) Those in which the condition fluctuated markedly in both directions (61.7 per cent).

A careful examination of the illustrative charts of cases 1 to 16 (charts 1, 2 and 3) shows that an increase or decrease of pain, as the case may be, occurring during the use of digitalis, was reproduced in every instance by a placebo or another control agent. The lack of causal relationship between the specific action of the digitalis and the change in pain is directly disclosed in the majority of cases by the disappearance of the change even when, as in some cases, administration of the drug was continued or, as in others, after an interruption a course of digitalis medication was repeated. In cases in which the use of the drug in tablet form was attended by increased pain during more than one course, the change vanished when the tincture in equivalent doses was substituted, indicating clearly that the increased pain was not due to a direct action of the digitalis on the heart or circulation.

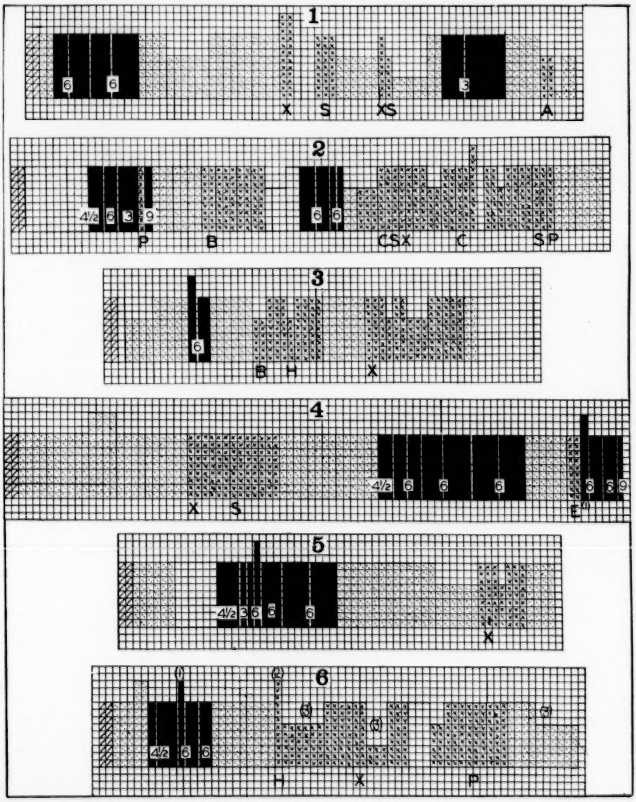


Chart 1.—Course in cases 1 to 6. The first column of each chart is made to represent the habitual status of the patient. It is arbitrary, nine squares high, and a column of the same height may refer to pain of different severity in different patients. The periods between individual visits to the clinic are marked off by the dark lines or by white lines between black columns. An increase in pain is indicated by an upward direction of the column and a decrease by a downward direction, as follows: slight (change of column by three squares); moderate (change of column by six squares); marked (change of column by eight squares). The solid black columns always indicate digitalis. The dotted columns always indicate a placebo. The cross-hatched columns always indicate active agents and are labeled as follows: *X* (xanthine), *S* (sodium salicylate), *H* (calomel), *Bi* (sodium bicarbonate), *CS* (cascara sagrada), *C* (codeine sulfate), *B* (barbital), *P* (phenobarbital), *A* (acetylsalicylic acid) and *E* (physostigmine salicylate). Blank columns indicate periods without medicine. The numbers on the black columns indicate the daily dosage of digitalis in grains or, where indicated, minims of the tincture of digitalis.

COMMENT

The results obtained in this study are similar to those of others where the conditions are comparable. They show that some patients report an increase in the severity of cardiac pain and others a decrease during the use of digitalis. The additional steps which we took in order to determine the role of digitalis in the causation of these changes, namely, comparison with a placebo, the "blind test," repeated long courses of digitalis with the form, taste and color of the drug masked, reveal, however, that the systemic action of the glucoside is not responsible for the changes in cardiac pain.

These results are not to be taken to indicate a belief that digitalis under no circumstances influences cardiac pain. It is well known that cardiac pain occurring in the course of heart failure with congestion is relieved by digitalis, which restores compensation. There are

also instances of heart failure in which the relief of congestion by digitalis appears to establish or increase the severity of attacks of cardiac pain. Since digitalis exerts several actions it is not remarkable that the result of conflicting effects should occasionally intensify cardiac pain in a person in whom one or another function may show inordinate susceptibility. This is quite apart, however, from the customary actions of the drug. The patients we studied were those with coronary artery disease with angina pectoris and without signs of congestion. In this group, comprising persons who are unduly susceptible to reduction of coronary flow, not one instance was encountered presenting unequivocal evidence that digitalis had intensified the cardiac pain, even though the drug was used in doses so large as to cause toxic symptoms in about 38 per cent of the cases. This is our basis for the inference that digitalis does not habitually cause constriction of the coronary arteries in man and that it does not tend to exert an unfavorable influence on the relation between cardiac work and coronary flow.

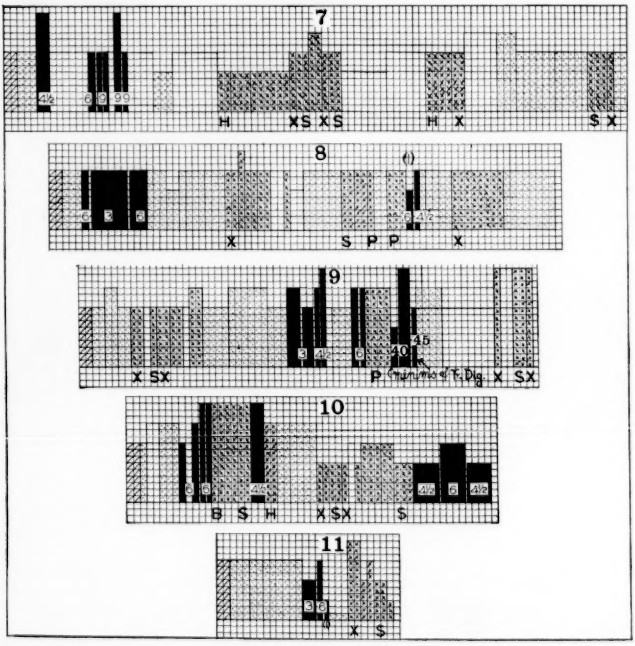


Chart 2.—Course in cases 7 to 11.

SUMMARY AND CONCLUSIONS

1. The effect of digitalis medication on cardiac pain was investigated in a series of 120 patients with angina pectoris.

2. The following criteria were used for the selection of these patients: evidence of organic heart disease, absence of signs of congestion, cardiac pain on effort, doing little or no physical work and faithful cooperation.

3. The effect studied was the influence on the severity and frequency of attacks of pain and on the capacity for effort without pain. The data were secured in accordance with a plan designed to reduce to a minimum common sources of error and in a manner relatively free from bias by the use of the "blind test."

4. In all, 243 courses of treatment with fairly large daily doses of digitalis (from 0.2 to 0.6 Gm.) were given, each lasting an average of eleven weeks and being alternated with a course of a placebo of lactose or some other agent.

5. The course of the pain was charted, the habitual status as well as graded departures from it being represented in every case. The causal relation was established by a method relatively free from personal judgments; namely, by comparing sections of the chart representing, respectively, placebo and digitalis periods.

6. The results show that nearly one half of all the patients reported a departure from their habitual status on their return visit after the first course of treatment with digitalis; in about 15 per cent the pain was increased and in about 30 per cent it was diminished. Results bearing a strong similarity to these were obtained, however, during the use of a placebo.

7. In most cases the change in pain failed to persist when administration of the drug was continued or failed to reappear during repeated courses of digitalis.

8. In the remaining cases in which the change recurred when the course of digitalis was repeated, it was possible to digitalize fully without any apparent effect on pain by altering the form, color or flavor of the preparation of digitalis.

It is concluded from these facts that in cases of angina pectoris without congestion the likelihood is negligible that the use of digitalis will, by a direct action on the circulation, increase or diminish cardiac pain.

In view of the fact that the patients of this series were presumably unusually susceptible to cardiac ischemia, the results indicate further that digitalis even in large doses rarely, if ever, produces effective constriction of the coronary arteries in man.

REPORT OF CASES

CASE 1 (L. L., a man, aged 44).—The diagnosis was arteriosclerosis, hypertension, enlarged heart, coronary and aortic sclerosis, regular sinus rhythm and pain 3+. The duration of study was seventy-six weeks.

CASE 2 (A. K., a man, aged 53).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3+. The duration of study was eighty-two weeks.

CASE 3 (E. H., a man, aged 50).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 1 +. The duration of study was fifty-nine weeks.

CASE 4 (A. C., a woman, aged 45).—The diagnosis was hypertension and arteriosclerosis, enlarged heart, coronary sclerosis, regular sinus rhythm and pain 2 +. The duration of study was eighty-six weeks. In part of the period indicated in the chart (chart 1) by (1) the patient reduced the dose to 3 grains (0.2 Gm.) because she believed that 6 grains (0.4 Gm.) had increased the pain. This effect failed to reappear when the subsequent doses were even larger.

CASE 5 (T. E., a man, aged 70).—The diagnosis was arteriosclerosis, hypertension, enlarged heart, regular sinus rhythm and pain 2 +. The duration of study was sixty weeks.

CASE 6 (J. P., a man, aged 46).—The diagnosis was arteriosclerosis, coronary sclerosis, regular sinus rhythm and pain 2 +. The duration of study was sixty-six weeks. In the period indicated in the chart (chart 1) by (1), the patient also complained of dizziness and palpitation. In the period indicated by (2) the weather was cold, and the patient stated that he always felt worse in cold weather. In the periods indicated by (3) the weather was warmer.

CASE 7 (M. C., a man, aged 61).—The diagnosis was arteriosclerosis, coronary sclerosis, enlarged heart, bundle branch block, regular sinus rhythm and pain 3 +. The duration of study was ninety-four weeks.

CASE 8 (S. O., a man, aged 55).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3 +. The duration of study was seventy-six weeks. In the period indicated in the chart (chart 2) by (1) 18 grains (1.15 Gm.) was given at one time and there was vomiting. Note that pain was not increased even at the toxic level.

CASE 9 (M. A., a man, aged 70).—The diagnosis was arteriosclerosis, coronary and aortic sclerosis, regular sinus rhythm and pain 3 +. The duration of study was sixty-eight weeks.

CASE 10 (J. M., a man, aged 67).—The diagnosis was arteriosclerosis, enlarged heart, coronary sclerosis, regular sinus rhythm and pain 2 +. The duration of study was fifty-four weeks.

CASE 11 (W. J., a man, aged 42).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 2 +. The duration of study was twenty-five weeks. In the period indicated in the chart (chart 2) by (1) a placebo tablet was given with the digitalis.

CASE 12 (P. D., a man, aged 64).—The diagnosis was arteriosclerosis, hypertension, enlarged heart, aortic sclerosis, regular sinus rhythm and pain 2 +. The duration of study was 119 weeks.

CASE 13 (S. R., a man, aged 69).—The diagnosis was arteriosclerosis and hypertension, enlarged heart, coronary sclerosis, regular sinus rhythm, severe secondary anemia and pain 3 +. The duration of study was 159 weeks. Just prior to the period indicated in the chart (chart 3) by (1) a hemorrhoidectomy was performed, and during the long period that followed there was gradual improvement in the anemia. Note that in the period indicated by (2), while pain was very severe during the use of a daily dose of 6 grains (0.4 Gm.) in tablet form, there was no pain when the equivalent in the form of a tincture was used even to the point of toxic symptoms (nausea and vomiting).

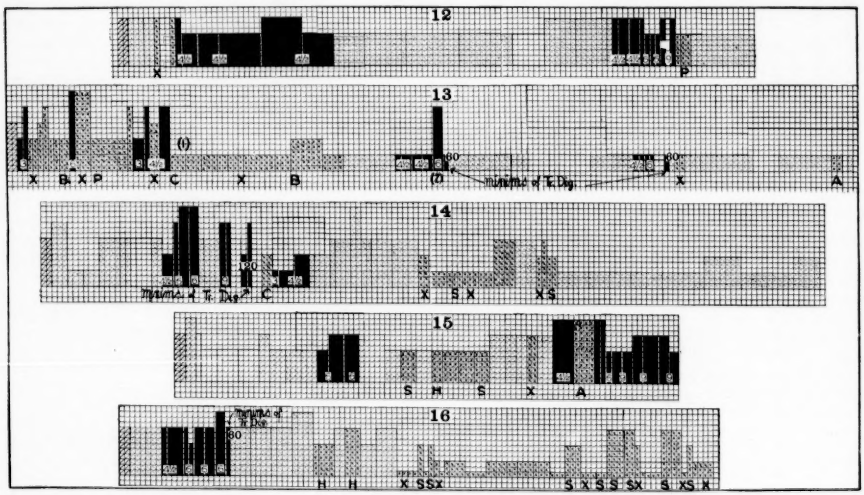


Chart 3.—Course in cases 12 to 16.

CASE 14 (M. G., a man, aged 56).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3 +. The duration of study was 146 weeks.

CASE 15 (B. G., a man, aged 58).—The diagnosis was arteriosclerosis, coronary thrombosis, regular sinus rhythm and pain 3 +. The duration of study was ninety-four weeks.

CASE 16 (C. E., a man, aged 68).—The diagnosis was arteriosclerosis, enlarged heart, coronary sclerosis, regular sinus rhythm with ventricular premature contractions and pain 3 +. The duration of study was 111 weeks.

1300 York Avenue.

Spotted Fever in Canada.—This disease is endemic in southwestern Montana and the surrounding territory and is quite prevalent there, and it has been recently reported from most of the United States. In 1923 it reached Manyberries, Alta. Here twelve cases have occurred. Last year one of these came from 75 miles east, and, according to Dr. F. C. Middleton, director of the Provincial Board, was the first case reported to Regina. This seems to be the first invasion of Canada.—Duncan, J. H.: Rocky Mountain Spotted Fever in Canada, *Canad. M. A. J.* **37**:575 (Dec.) 1937.

PREVALENCE, INCIDENCE AND TREND OF SYPHILIS IN CHICAGO

IN THE SPRING AND SUMMER OF 1937

LIDA J. USILTON, M.A.
Statistician, United States Public Health Service
HOWARD HUNTER, A.B.
Assistant Administrator, Works Progress Administration
AND
R. A. VONDERLEHR, M.D.
Assistant Surgeon General, Division of Venereal Diseases, United States Public Health Service
WASHINGTON, D. C.

The health authorities of the state of Illinois and the city of Chicago requested the United States Public Health Service to cooperate with the Works Progress Administration to determine the number of persons with syphilis actually under observation and treatment by all authorized medical sources of treatment in Chicago.

TABLE 1.—*Patients Constantly Under Treatment and Observation in Chicago in 1937 (Rate per 10,000 of Population)*

	White	Negro	Other Races	Total
Total patients.....	8,535	5,606	308	14,349
	Rate	Rate	Rate	Rate
Male.....	33	200	105	45
Female.....	24	273	150	43
Total.....	28	237	121	44

Every clinic cooperated in the survey. Private physicians furnished nonidentifying information about the patients with syphilis under their care. Of the 5,652 physicians in active practice in Chicago, 99.6 per cent cooperated in this undertaking.

The survey period selected was from March 1 to June 30, 1937. Every case record was included provided the patient had been in a clinic, hospital or institution or under the care of a private physician for treatment or observation for syphilis during the survey period, regardless of the time he first sought treatment for the infection. There were 19,000 records studied.

The survey has established:

1. The number of patients actually under observation and treatment for syphilis by an authorized medical source in Chicago.
2. The number of known fresh infections occurring annually in Chicago.
3. The stage of syphilis at which patients seek treatment.
4. The age of persons at the time of acquiring syphilis.
5. The proportion of patients in each stage of syphilis who were untreated before seeking treatment for the particular manifestation detected on admission.
6. The frequency of mucocutaneous (communicable) relapses.
7. The effort that is made to detect neurosyphilis in the early stages so as to prevent the development of dementia paralytica.
8. The proportion of women with syphilis who receive sufficient treatment early in pregnancy to prevent the transmission of the disease to the child.
9. The results of pregnancy in terms of the stage of the mother's syphilis and the amount of antisyphilitic treatment given during pregnancy.

No effort has been made in this report to compare the incidence of syphilis in Chicago with that in other parts of the nation, although such data are available on request from the United States Public Health Service.

PREVALENCE

The term prevalence, as used in this report, represents the number of persons under treatment for syphilis, day by day, by authorized medical sources.

There are 14,350 patients with syphilis constantly under medical care in Chicago. The rate for syphilis per 10,000 population is 44. Although the Negroes represent only 7 per cent of the population, the rates indicate that there is almost as much syphilis in this comparatively small group as there is in the entire white population of the city. In this study syphilis is shown to be eight and a half times as frequent in the Negro as in the white population (rate per 10,000 of population: 28 white and 237 Negro). This ratio of syphilis in the white and the Negro population is higher than has been found in most communities in which treatment facilities are accessible.

INCIDENCE

The term incidence, as used in this report, represents the case rate, or the number of new patients who seek treatment annually. Annual incidence is based on the number of new patients admitted during the four month period from March 1 to June 30, 1937.

In Chicago each year approximately 15,500 persons seek treatment for syphilis. Only 2,500 of these seek treatment during the early stages of the infection. Thus more than 84 per cent of the patients under treatment have failed to take advantage of the opportunity for "cure" that early and adequate treatment affords. It is interesting to note the ratio of incidence to prevalence. The incidence rate for syphilis per 10,000 of population is 47 and the prevalence rate 44. These rates indicate that patients remain under treatment for syphilis for approximately one year.

TABLE 2.—*Annual Attack Rate for Syphilis in Chicago in 1937 (Rate per 10,000 of Population)*

	White	Negro	Other Races	Total
Total patients.....	8,094	7,133	211	15,438
	Rate	Rate	Rate	Rate
Male.....	33	295	137	52
Female.....	21	308	98	43
Total.....	27	302	123	47

Since clinic and private patients, as is subsequently shown, average only twelve injections of arsphenamine with interim heavy metal therapy during the first two years, it is apparent that treatment is interspersed with long lapses which seriously interfere with its efficacy. Further evidence of neglect of therapy is the fact that only 23 per cent of the private patients who begin treatment during the early stage of syphilis continue until they have had the minimum amount (twenty injections of arsphenamine with appropriate heavy metal therapy) to render them noninfectious and to protect them rea-

Under the direction of Thomas Parran, Surgeon General, United States Public Health Service.

Read before the South Chicago Branch and the Calumet Branch of the Chicago Medical Society, Dec. 14, 1937.

Mr. Arthur Carstens, Mrs. Ethel E. Finn and Mr. Lawrence Linck supervised and helped the field force engaged in abstracting the data in this article. The success of the project was dependent largely on the earnestness, integrity and intelligence with which the following thirty-five senior medical students of the several universities of Chicago performed the field work: B. Abrams, M. Albin, B. Bielinski, C. Bond, J. Bowman, A. Carlson, H. Einhorn, R. Fort, I. Friedman, R. Fruin, H. Fuqua, L. Gelfand, S. Gerber, R. Gradman, M. Grubman, D. Haftkowski, M. Herzberg, E. Irons, H. Joffe, M. Kruglik, L. Moench, G. Osborne, M. Pearlman, M. Rosenthal, H. Rothenberg, O. Rushakoff, R. Ryde, A. Sandor, B. Schaffer, L. Smith, C. Svare, G. von Asch, F. Walker, B. Weinberg and S. Wilson.

sonably well from the late manifestations of the disease. Approximately half of the patients with early syphilis under treatment in clinics receive the minimum required therapy before they lapse from treatment.

EFFECT OF THE SYPHILIS CAMPAIGN IN BRINGING EARLY SYPHILIS UNDER TREATMENT

The survey permitted a series of prevalence rates to be established at fifteen day intervals from March 1 to June 30. From chart 2 it will be observed that there was a persistent upward trend from March 1 to June 30. This upward trend was the result of an increase in the number of private patients seeking treatment for early syphilis. For every 100 patients with early syphilis under the care of the private physician on March 1, 1937, there were 126 patients on April 15 and 146 patients on June 15. This remarkable trend is a tribute to those who have sought to awaken the public to a consciousness of syphilis and to make known the promise of "cure" that lies in early and adequate treatment. It did not exist for those patients who sought clinical care. It is apparent that the present campaign is reaching the middle economic group. The trend reveals the whole-hearted cooperation of the medical profession in Chicago in the present syphilis campaign.

It is interesting that the number of Negroes under treatment and observation for early syphilis has more than trebled. In other words, the response to pleas for early treatment has been greater in the racial group in which the infection is more frequent.

Further evidence of the awakened attention of the middle class to the need for early and adequate treatment is found in a comparison of the number of patients with early syphilis who were constantly under observation and treatment by the private physician with the number who sought treatment during the survey period. There was an increase of 17 per cent in the total number of the latter over the former. Chart 3 shows that 52 per cent of the patients with early syphilis who sought treatment during the survey period went to the private physician, in contrast with 26 per cent who were constantly under the care of private physicians. A 17 per cent increase in the number of persons with early syphilis who seek treatment cannot be interpreted as representing a fresh outbreak of the disease in a community in which 85 per cent of the previously infected population had neglected treatment until after the infection had reached the late stages.

TABLE 3.—*Effectiveness of the Syphilis Campaign in Bringing Patients with Early Syphilis Under Authorized Medical Care*

Patients with Early Syphilis	Physicians		Clinics		Total	Increase, Per-centage
	Number	Per-centage	Number	Per-centage		
Prevalence (constantly under treatment).....	538	26.5	1,547	73.5	2,105	
Incidence (new cases).....	1,287	52.3	1,176	47.7	2,463	17

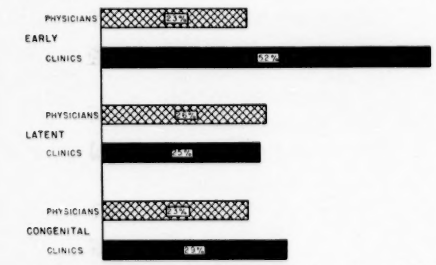


Chart 1.—Proportion of patients who received the minimum required treatment by stage of syphilis on admission.

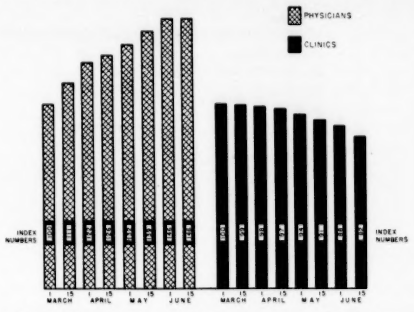


Chart 2.—Patients with early syphilis under the care of physicians and clinics on indicated dates; base index equals 100.

RELATIVE FREQUENCY OF EACH STAGE OF SYPHILIS IN A GIVEN POPULATION

A standardized nomenclature for syphilis prepared by the Committee of Experts on Syphilis and Cognate Subjects of the Health Organization of the League of Nations was used in classifying the cases of syphilis in this survey. This nomenclature is based on the clinical manifestations of the disease. Its use permits a statement on the relative frequency of each stage of syphilis in the total population under treatment for the infection.

As shown by the 19,000 case records included in the study, 1.5 per cent of the patients were admitted with seronegative primary syphilis, 4.4 per cent with seropositive primary syphilis, 8 per cent with secondary manifestations in the first year, 10.6 per cent with early latent syphilis, 43.6 per cent with late latent syphilis, 5 per cent with cardiovascular syphilis, 3 per cent with asymptomatic neurosyphilis, 6 per cent with tabes dorsalis, 3 per cent with dementia paralytica and 7 per cent with congenital syphilis. In most of the cases of congenital syphilis the disease was not detected until after the third year of the child's life.

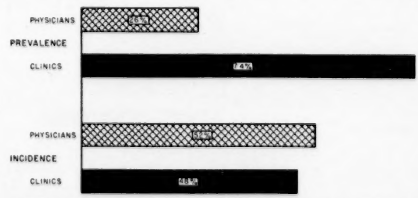


Chart 3.—Proportion of patients with early syphilis by source of treatment at the beginning of the survey (prevalence) and at the termination of the survey (incidence).

AGE INCIDENCE

Syphilis is contracted with the greatest frequency in early adult life. In fact, 59 per cent of the persons who acquired syphilis did so before they were 30 years of age.

The age incidence of persons with syphilis who are under the care of the private physician, as contrasted with those who are under the care of the clinic, is of

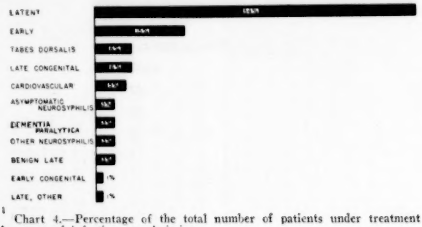


Chart 4.—Percentage of the total number of patients under treatment by stage of infection on admission.

interest. Sixty-four per cent of the patients under treatment at clinics and 45 per cent of the patients of private physicians acquire the infection before the age of 30. Neglect of treatment is probably somewhat dependent on the early age at which syphilis is acquired. Persons in the early age groups have not in many instances reached an earning capacity which enables them to pay even minimum private rates. The youthfulness of persons acquiring syphilis should make a strong appeal to those charged with maintaining the health of the nation.

EVIDENCE OF FAILURE TO DETECT AND TREAT SYPHILIS EARLY

Of approximately 11,400 patients under treatment and observation for late or latent syphilis in the clinics at any time during the survey period, 8,200, or 72 per cent, had had no prior treatment and only 6 per cent had had the minimum prescribed therapy. Of those with cardiovascular syphilis, 82 per cent had had no prior treatment. This high proportion of syphilis

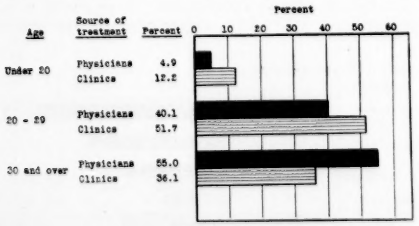


Chart 5.—Percentage distribution of private and clinic patients by age at which the disease was acquired.

remaining untreated during the infectious stage stresses the need for a more general use of the "Wassermann dragnet."

Important as it is to detect syphilis in the early stage, it is equally important that the patient receive the minimum required therapy before he is permitted to lapse. The machinery for holding such patients under treatment must be made more effective if syphilis is to be controlled. Undoubtedly many factors influence the inability of physicians and clinics to hold patients under observation and treatment. An effort was made to determine some of these factors. A study of the distance a patient travels from his home to the nearest clinic was made. It was found that a round trip averages nine miles.

The study shows that of patients under the care of private physicians only 23 per cent receive sufficient arsphenamine with interim heavy metal therapy to prevent infectious relapse, whereas the clinic holds 52 per cent until they have received the minimum required treatment. The apparent greater willingness of persons with early syphilis to seek medical care from the private physician is associated with the greater difficulty of the private physician to hold patients, or a sufficient proportion of them, until they are no longer a menace to the health of the community. It is pos-

TABLE 4.—*Relative Frequency of Each Stage of Syphilis on Admission for 19,071 Patients*

Stage of Syphilis on Admission	Total Percentage
Seronegative primary	1.5
Seropositive primary	4.4
Secondary within first year	8.0
Secondary after first year	1.4
Latent, early (within 4 years of infection)	10.6
Latent, late (4 years or more after infection)	43.6
Late	
Skin and mucous membrane	2.4
Visceral	0.3
Cardiovascular	
Unspecified	1.1
Uncomplicated aortitis	2.2
Aortic regurgitation	0.5
Myocarditis	0.3
Coronary sclerosis	0.1
Aneurysm	0.4
Myocardial failure	0.3
Bone and joint	0.3
Neurosyphilis	
Asymptomatic	3.0
Meningeal	0.2
Vascular	0.5
Meningovascular	0.8
Dementia paralytica	3.2
Optic atrophy	0.4
Tabes dorsalis	5.6
Other unclassified	1.3
Ocular	0.4
Congenital, early	
Within first week	0.04
1 week to 6 months	0.6
6 months to 3 years	0.6
Congenital, late	
3 years and over	6.0
Total	100.0

sible that the clinics make better use than do the physicians of the machinery provided by the local health service for returning to treatment patients who have lapsed. The nominal fee for treatment in clinics may be an important factor in holding medically indigent patients until adequate treatment has been administered. The physician is able to hold a good proportion of the patients with late manifestations of syphilis until they have received adequate therapy. Although adequate treatment for these patients is highly desirable, it is not the paramount issue in the prevention and control of syphilis.

The study reveals that neither the clinic nor the physician has succeeded in giving the patients an average of more than twelve injections of arsphenamine with interim heavy metal therapy within the all-important first two years of treatment and observation. Furthermore, 67 per cent of the physicians' patients and 44 per cent of the clinics' patients who are no longer under treatment disappear in the first two years. Patients in

V 11
1938

the group "no longer under treatment" include those who have not been seen at the source of treatment for sixty days or more. It is noted that the twelve injections have increased to fifteen injections of arsphenamine with appropriate heavy metal therapy in the same treatment-observation period for patients "still under treatment." This fact indicates some improvement in the prevention of lapses from treatment. Chart 7 shows the rapid disappearance of physicians' patients from treatment and observation and the limited number of patients who remained long enough to receive an adequate amount of treatment to insure the maximum benefits.

FREQUENCY OF MUCOCUTANEOUS RELAPSE

A mucocutaneous (communicable) relapse occurred in 5.3 per cent of the patients with early syphilis. This emphasizes the need for preventing lapses from treatment before the patient is definitely rendered noninfectious. Mucocutaneous relapses have a serious public health import because they occur at a time when an inadequately treated patient is no longer conscious of his syphilis and therefore becomes a dangerous and hidden source in the spread of the disease. This point is emphasized because of the large number of persons

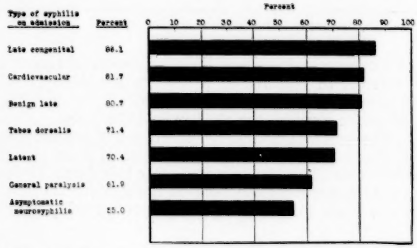


Chart 6.—Type of syphilis on admission to clinics, showing the percentage of patients previously untreated.

with early syphilis who fail to receive the minimum amount of treatment required to render them permanently noninfectious.

SOURCE OF TREATMENT

A study was made of the distribution of the white and Negro patients with syphilis under treatment any time during the survey period by physicians and various types of clinics. Thirty-four per cent of the patients were treated in free, tax-supported clinics, 25 per cent by private physicians, 18 per cent in free or part pay clinics supported by private funds, 12 per cent in part pay clinics supported by taxes and private funds and 11 per cent in full-pay clinics supported wholly by private funds. A preponderance of the Negroes were treated in free, tax-supported clinics. The full-pay clinics supported by private funds had the smallest proportion of Negro clientele.

DISTRIBUTION OF PATIENTS UNDER PRIVATE CARE

Of the 5,652 physicians in active practice in Chicago, 1,510 reported one or more patients with syphilis under observation and treatment. Of the private patients 51 per cent were under the care of physicians who had only from one to four patients with syphilis. A group of specialists representing 1 per cent of the physicians in Chicago had 24 per cent of the private patients with syphilis.

SIGNIFICANCE OF THE BLOOD TEST IN PROGNOSTICATING CLINICAL PROGRESSION OR RELAPSE

A study was made of the significance of the positivity of the blood or serologic test on the termination of treatment in terms of clinical progression and relapse. Of the 9,719 patients who had a positive serologic reaction, 285, or 3 per cent, experienced a clinical relapse. Of 3,791 patients who had a negative reac-

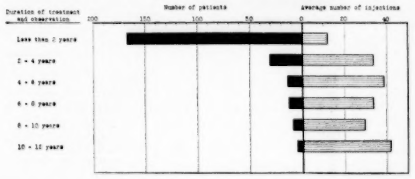

Duration of treatment and observation
Number of patients
Average number of injections
200 150 100 50 0 20 40
Less than 2 years
2 - 4 years
4 - 6 years
6 - 8 years
8 - 10 years
10 - 12 years

Chart 7.—Number of patients treated and observed by physicians for the indicated length of time, showing the average number of injections of arsphenamine received.

tion of the blood, 4 per cent experienced a clinical relapse. A review was made of the severity of the clinical manifestations in the two types of patients. It was found that they did not vary significantly. Thus, the reaction of the blood was an inefficient guide to the ultimate clinical outcome.

The effect of therapy was also evaluated, with the arsenical drug as the index. It is significant that in some cases seventy or more injections of arsphenamine with interim heavy metal therapy failed to reverse a persistently positive reaction; in a few cases as many as 180 injections of arsphenamine and 460 injections of bismuth compounds were not effective.

FAILURE TO EXAMINE THE SPINAL FLUID

It was found that no institution or clinic in Chicago was making examinations of the spinal fluid as a routine for all patients. On the average, 70 per cent of the patients had no such examination. This percentage varied from clinic to clinic. Only a few clinics were so examining as many as half of the patients with latent or late syphilis. Practically none of them made a significant number of examinations of the spinal fluid for patients with early syphilis. Such examina-

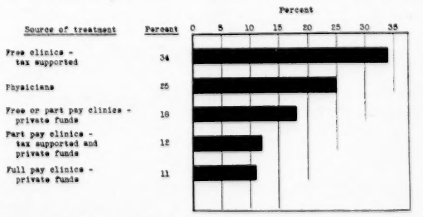

Source of treatment
Percent
Percent
0 5 10 15 20 25 30 35
Free clinics - tax supported 34
Physicians 25
Free or part pay clinics - private funds 18
Part pay clinics - tax supported and private funds 12
Full pay clinics - private funds 11

Chart 8.—Percentage distribution of patients by source of treatment; figures based on all patients treated by physicians and clinics in the survey period.

tions were made more frequently for patients with negative reactions of the blood than for patients with positive reactions.

A higher proportion of the examinations of the spinal fluid were made for the white patients in clinics than for the Negroes. Of 11,400 persons to whom

no previous treatment had been administered, 1,100 (10 per cent) had a negative reaction of the blood on admission. Of these patients, 15 per cent had a positive reaction of the spinal fluid despite the fact that the spinal fluid of only a third of the total number of patients was examined.

TABLE 5.—*Stage of Syphilis on the Patient's Admission to the Clinic and the Amount of Antisyphilitic Treatment Received Prior to Admission*

	Amount of Antisyphilitic Treatment Received Prior to Admission								
	None		Heavy Metal Therapy Only		Less Than 20 Injections of Arsphenamine, with Heavy Metal Therapy		More Than 20 Injections of Arsphenamine, with Heavy Metal Therapy		
Stage of Syphilis on Admission	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Total
Early acquired	1,711	83.9	20	1.0	285	13.9	24	1.2	2,040
Early congenital	194	89.8	3	1.4	17	7.9	2	0.9	216
Latent	5,205	70.4	268	3.6	1,519	20.5	403	5.5	7,395
Benign late	348	80.7	15	3.5	51	11.8	17	4.0	431
Cardiovascular	558	81.7	21	3.1	88	12.9	16	2.3	683
Asymptomatic neurosyphilis	257	55.0	14	3.0	115	24.6	81	17.3	467
Tabes dorsalis	558	71.4	27	3.4	123	15.7	74	9.5	782
Dementia paralytica	143	61.9	9	3.9	54	23.4	25	10.8	231
Other neurosyphilis	251	73.2	16	4.7	44	12.8	32	9.3	343
Other late (ocular and visceral)	116	87.2	..	..	13	9.8	4	3.0	133
Late congenital	694	86.1	12	1.5	67	8.3	33	4.1	806
Stage not reported	104	87.4	2	1.7	13	10.9	..	..	119
Total	10,139	74.3	407	3.0	2,389	17.5	711	5.2	13,646*

* This total represents all patients under treatment by clinics at any time during the survey period.

PREGNANCY

In the clinics there were 6,500 women over 16 years of age with syphilis. Of these 11 per cent became pregnant after infection with syphilis. All of these women received some antisyphilitic therapy during pregnancy.

The proportion of stillbirths for women who did not have syphilis was compared with the proportion for those who had syphilis. It was found that only 2 per cent of the pregnancies of nonsyphilitic women result in stillbirths, as compared with 10 per cent for those with syphilis. This percentage of disastrous outcomes of pregnancy in syphilitic women was reduced to 5 per cent or less, depending on the amount of antisyphilitic treatment that was given the mother during pregnancy. It has been reported that treatment begun before the fifth month of pregnancy is most effective in obtaining a live, nonsyphilitic infant. However, syphilis had not been detected in at least half of the syphilitic pregnant women before the fifth month. Further evidence of the inadequate control of syphilis in pregnancy in Chicago clinics was the fact that of those pregnant women in whom syphilis was detected before the fifth month, only 21 per cent persisted in treatment throughout pregnancy or until they had received sufficient treatment to assure the birth of a living nonsyphilitic infant.

A complete evaluation of the effectiveness of treatment in terms of outcome of pregnancy for the syphilitic women in Chicago clinics was seriously impaired by failure to examine the child in half the cases.

The material was divided between those pregnant women with syphilis who were delivered prior to 1936 and those who were delivered after this date. Unfortunately, a comparison between these two groups fails to indicate that any higher proportion of pregnant women begin treatment before the fifth month of pregnancy or that any greater proportion of those who do are persisting with treatment until they have received a sufficient amount to prevent the transmission of the disease to the child.

TABLE 6.—*Average Number of Injections of Arsphenamine Administered to Patients During the Treatment-Observation Period According to Sources of Treatment* *

	Still Under Treatment				No Longer Under Treatment			
	Physicians		Clinics		Physicians		Clinics	
Duration of Treatment and Observation for Syphilis, Years	Number of Patients	Average Number of Injections	Number of Patients	Average Number of Injections	Number of Patients	Average Number of Injections	Number of Patients	Average Number of Injections
Less than 2	2,651	15	4,731	15	168	12	464	12
2 to 4	395	39	1,864	27	31	34	266	24
4 to 6	106	45	881	46	14	39	173	30
6 to 8	72	55	412	37	13	34	80	32
8 to 10	44	43	168	44	9	30	35	38
10 to 12	32	55	62	44	5	42	12	61
12 and over	94	50	60	55	10	34	22	48
Total	3,394	21	8,178	34	250	20	1,052	22

* Patients who did not receive any arsphenamine or were given an unknown amount are omitted.

SUMMARY

The health authorities of the state of Illinois and the city of Chicago requested the United States Public Health Service to cooperate with the Works Progress Administration to determine the number of persons with syphilis under treatment and observation by all authorized medical sources in Chicago. Every clinic

V 11
1938

and 99.6 per cent of the physicians in active practice cooperated in this undertaking.

There are 14,350 patients with syphilis constantly under medical care in Chicago (rate per 10,000 of population, 44). Syphilis is eight and five-tenths times more frequent in the Negro than in the white population (rate per 10,000 of population, 237 Negro and 28 white).

Approximately 15,500 persons with syphilis seek treatment annually (rate per 10,000 of population, 47). Only 2,500 of the 15,500 are in the early stage.

Of those who do seek treatment for syphilis in the early stages, only 23 per cent of the private patients and 52 per cent of the clinic patients receive the minimum effective therapy before they disappear from observation.

A series of prevalence rates, established at fifteen day intervals from March 1 to June 30, showed that for every 100 patients with early syphilis under the care of private physicians on March 1 there were 126 patients on April 15 and 146 patients on June 15. This upward trend did not exist for those patients with early syphilis who sought clinic care.

There was an increase of 17 per cent in the total number of persons with early syphilis who sought treatment during the survey period over those constantly under observation and treatment.

Fifty-two per cent of the persons who sought treatment for early syphilis during the survey period came to the private physician, in contrast with 26 per cent of the patients with early syphilis who were constantly under the care of private physicians.

The use of a uniform nomenclature in abstracting the cases under treatment permits a statement on the relative frequency of each stage of syphilis in a given total population.

Fifty-nine per cent of those who acquire syphilis do so before the age of 30 years.

Sixty-four per cent of clinic patients, as contrasted with 45 per cent of patients under the care of private physicians, acquire their infection before the age of 30.

Of approximately 11,400 clinic patients with late or latent syphilis seen any time during the survey period, 72 per cent had had no prior treatment, and only 6 per cent had had the minimum prescribed therapy.

Of the patients with cardiovascular syphilis, 82 per cent had had no treatment prior to the detection of this manifestation.

Mucocutaneous relapse occurred in 5.3 per cent of the patients with early syphilis.

Of the 5,652 physicians in active practice in Chicago, 1,510 reported one or more patients with syphilis under observation and treatment. A group of specialists representing 1 per cent of the physicians in Chicago had 24 per cent of the private patients with syphilis.

Of the 9,719 patients who had a positive serologic reaction on the termination of treatment, 3 per cent experienced a clinical progression or relapse. Of 3,791 patients with a negative reaction of the blood on the termination of treatment, 4 per cent experienced a clinical progression or relapse.

In some cases seventy or more injections of arsphenamine with appropriate heavy metal therapy failed to reduce a persistently positive reaction; in a few cases as many as 180 injections of arsphenamine and 460 injections of a bismuth preparation were not effective. In no institution or clinic in Chicago are examinations of the spinal fluid done for all patients. On the average, 70 per cent of the patients had no such examination. In only a few clinics were half the patients with late or latent syphilis examined.

In the clinics there were 6,500 women over 16 years of age with syphilis. Of these, 11 per cent became pregnant after acquiring syphilis.

Fifteen per cent more of the mothers under 30 than of the mothers over 30 were delivered of living infants.

Among nonsyphilitic women, 2 per cent of the pregnancies result in stillbirths; among those with syphilis, 10 per cent. Treatment of the syphilitic mother during pregnancy reduces the percentage of stillbirths to 5 per cent or less.

In half of the women syphilis was not detected until after the fifth month of pregnancy. Of those in whom it was detected before the fifth month, only 21 per cent persisted in treatment throughout pregnancy or until they had received sufficient treatment to insure the birth of a living, nonsyphilitic infant.

A complete evaluation of the effectiveness of the treatment of pregnant syphilitic women in Chicago clinics was seriously impaired by failure in half the instances to examine the child.

TABLE 7.—*Percentage of Patients Treated by Private Physicians and in Various Types of Clinics at Any Time During the Survey Period, According to Race and the Stage of Syphilis on Admission*

Stage of Syphilis on Admission	Number of Patients			Treated by Physicians		Treated in Various Types of Clinics							
						Free, Tax Supported		Part Pay, Tax and Private Funds		Full Pay, Private Funds		Free or Part Pay, Private Funds	
	Total	White	Negro	White, Per-centage	Negro, Per-centage	White, Per-centage	Negro, Per-centage	White, Per-centage	Negro, Per-centage	White, Per-centage	Negro, Per-centage	White, Per-centage	Negro, Per-centage
Early	2,824	1,639	1,185	40	14	21	71	8	5	21	4	10	6
Latent	9,791	5,160	4,631	39	11	21	63	9	12	16	3	15	11
Benign	488	302	186	19	5	19	51	14	20	11	3	37	21
Cardiovascular	872	472	400	39	5	10	31	5	30	16	3	30	31
Asymptomatic neurosyphilis	563	479	84	20	10	12	45	13	8	34	18	21	19
Tabes dorsalis	990	789	201	28	3	13	29	7	51	23	4	29	13
Dementia paralytica	323	281	42	32	17	16	36	11	21	20	2	21	24
Other neurosyphilis	539	387	152	49	10	7	46	6	26	13	2	25	16
Other late (ocular and visceral)	153	84	69	21	7	12	42	37	32	6	..	24	19
Early congenital	222	135	87	6	2	3	28	7	22	4	..	80	48
Late congenital	957	690	267	23	5	11	29	14	25	9	1	43	40
Stage not reported	118	66	52	21	2	20	54	30	38	20	..	9	6
Total	17,840*	10,484	7,356	35	10	18	58	10	15	17	3	20	14

* There were 321 patients of races other than the white and the Negro race who were omitted from this table.

CALCIUM METABOLISM AND TEETH

ISAAC SCHOUR, D.D.S., PH.D.
CHICAGO

A number of important problems arise in the daily practice of dentistry that are related to the calcification of the teeth. These include the effects of pregnancy on the teeth of the mother, prenatal and postnatal calcification, the influence of the endocrine organs, the effects of dietary factors, mottled enamel, caries and the question of withdrawal of calcium from teeth.

NORMAL CALCIUM METABOLISM

An intelligent answer to any of these questions requires an understanding of the normal processes. Yet it appears that the normal processes cannot be understood until the valuable clues that come from pathologic and experimental studies have been obtained. Claude Bernard,[1] the father of experimental medicine, pointed out that disease is nature's experiment to cope with an abnormal condition. If there is recovery, nature's experiment is successful. Significant information has come and will come from careful observation of nature's methods of combating diseases which are experimentally produced and carefully controlled.

To discuss properly the question of the calcification of the teeth, it is necessary to review at least briefly the factors that are involved in calcification in general. The tooth does not form and calcify merely as an entity in itself but rather as a part of the body. The tooth is therefore subject, with of course some modification, to the same physical and chemical laws as the bones.

The calcium which is present in one's daily food is absorbed through the intestinal tract, whence it is carried into the blood stream. Calcium is present in the food in both organic and inorganic forms. It is probable that the organic must be converted to the inorganic form in the alimentary tract prior to being absorbed. Absorption of calcium occurs mainly in the upper regions of the small intestine.

The reaction of the intestinal contents is an important factor in the absorption of calcium, its salts being soluble in acid and insoluble in alkaline mediums. Foods which increase the acidity of the intestine favor solution of calcium. Sugars, especially lactose, which yield organic acids and consequently lower the p_H of the intestinal contents, favor absorption of calcium. An excess of fat in the diet is said to reduce the absorption of calcium as the result of formation of insoluble calcium soaps. A high phosphorus content in the diet also reduces the absorption of calcium, calcium phosphate being only slightly soluble.[2]

Sherman and Hawley,[3] in studies on children, found that the calcium of different foods is not equally absorbed, the calcium of milk being well utilized and that of certain vegetables poorly utilized.

After ingestion of large doses of soluble calcium salts, the serum calcium level rises. It reaches its maximum in about two hours; the normal level is reached again about three hours later. It is not possible to maintain the calcium level above normal by administration of massive doses of soluble calcium salts. This belief is based on the finding of large amounts of calcium in the feces. During a fast a considerable amount of calcium appears in the feces. This experimental fact proves that calcium is excreted continuously into the bowel independently of the calcium intake. The excretion occurs mainly through the wall of the bowel. Smaller amounts of calcium are excreted in the urine. Sherman and Hawley [3] found that children from 3 to 13 years of age receiving from 0.74 to 1.02 Gm. of calcium daily retained from 0.15 to 0.62 Gm. a day.

The calcium balance, i. e., the difference between the quantity of calcium ingested and that excreted in the feces and urine, is positive during growth, pregnancy and acromegaly or after a period of calcium starvation. The calcium balance is negative during infantile rickets, celiac or renal rickets, sprue, osteomalacia, hyperparathyroidism, hyperthyroidism, calcium deficiency (starvation) and, usually, lactation.

Calcium in the Blood.—In the blood, the amount of calcium is a physiologic constant. In the human being, as in most animals, its concentration ranges between 10 and 11 mg. per hundred cubic centimeters of serum. Many theories have been expounded in regard to the state in which calcium occurs in the blood. According to McLean and Hastings,[4] of the 10 mg. of calcium present in the hundred cubic centimeters of blood serum, 5 mg. is in the form of nondiffusible calcium bound to protein and practically 5 mg. is in the form of diffusible ionized calcium (Ca^{++}). They said that this diffusible ionized calcium is of "primary physiologic and clinical importance."

The calcium ion concentration in the blood is kept constant mainly by the action of the parathyroid secretions on the calcium which is in organic combination. When these are absent or deficient, as in the case of experimental parathyroidectomy, the calcium ion concentration is reduced from 5 mg. to 1.5-4 mg. per hundred cubic centimeters. In clinical and experimental hyperparathyroidism, the calcium ion concentration is raised from 5 to 5.5-8 mg.

The organism is protected against too sudden changes in the concentration of ionized calcium, first, by the reserve supply of calcium available in the blood calcium that is bound to protein [4] and, secondly, by the great reserve supply in the bones.

Calcium in the Bones.—Ninety-nine per cent of the calcium in the body is present in the skeletal system, presumably in the form of normal calcium orthophosphate and calcium carbonate. This calcium is in equilibrium with the blood calcium, so that the latter can be kept at a constant concentration by a shift of calcium from the bones to the blood or from the blood to the bones. The bones are constantly resorbed and rebuilt, and within normal limits they take in additional calcium readily and give up calcium just as readily. Calcification and withdrawal of calcium are continuous every day physiologic experiences of bone. Foote [5] has given this simple comparison: "As a banking institution receives money from depositors and holds it subject to check, so bone receives deposits of calcium salts from the different foods and pays them out on demand."

From the Department of Histology, University of Illinois College of Dentistry.

1. Bernard, Claude: An Introduction to the Study of Experimental Medicine, translated by N. C. Greene and L. J. Henderson, New York, Macmillan Company, 1927.
2. Best, C. H., and Taylor, N. B.: The Physiological Basis of Medical Practice, Baltimore, William Wood & Co., 1937.
3. Sherman, H. C., and Hawley, E.: Calcium and Phosphorus Metabolism in Childhood, J. Biol. Chem. **53**: 375 (Aug.) 1922.
4. McLean, F. C., and Hastings, A. B.: Clinical Estimation and Significance of Calcium Ion Concentration in the Blood, Am. J. M. Sc. **189**: 601 (May) 1935.
5. Foote, J. S.: Bone as a Measure of Development: When and How We Acquired our Teeth, Omaha, Press Douglass Printing Company, 1928.

V 1
193

Calcification of the Teeth.—The teeth are much more highly specialized than are the bones. While the bones are constantly decalcified and recalcified, the teeth undergo practically all of their calcification in an early period of their life cycle. They experience only a limited amount of subsequent secondary calcification and are not subject to withdrawal of calcium. Disturbances in calcification therefore influence only the growing tooth, that is, the tooth of the infant and child. The adult tooth, which is already fully formed, calcified and erupted, is not influenced by systemic disturbances in calcification. Failure to distinguish between the growing and the fully formed adult tooth has caused a great deal of unnecessary controversy and misunderstanding. A more detailed discussion of the calcification of the teeth is presented in the section on "Calcium Metabolism and the Growing Tooth."

CALCIUM METABOLISM AND THE ADULT TOOTH

When one examines the data on calcium metabolism that are available in regard to the adult tooth one finds mainly negative correlations. No evidence has yet been presented to show that teeth are subject to withdrawal of calcium. This simple fact has for the most part not been recognized by the dental and the medical professions. Both professions have carelessly regarded the teeth as a storehouse of calcium and have thus permitted the general acceptance of serious misconceptions. The addition of supplements of calcium to a so-called adequate diet has often been suggested and stressed as a preventive or a means of arrest of dental caries in the adult. Mothers have been warned that they would lose a tooth for every child unless they ingested sufficient additional calcium to prevent the loss of calcium from their teeth. This warning implied a provident gift of nature to conserve at least in part the dental apparatus by sacrificing only one particular tooth at a time instead of depleting a little from every tooth.

The question of withdrawal of calcium from the teeth is therefore sufficiently important to justify a brief review of the literature. Nearly two thousand years ago, Galen considered the teeth as bits of bone. In the sixteenth century, Eustachius [6] disproved this view and showed that the teeth are cutaneous appendages. Two hundred years later, with the rise of the science of physiology and the employment of the experimental method, John Hunter [7] conducted experiments with madder. He found a red coloration only in the tissues that were calcifying during the feeding of madder. In the animal that was allowed to live weeks after the feeding of madder, the red coloration disappeared from the bone but did not disappear from the dentin. Hunter therefore concluded that there is a vital difference between bone and dentin and that bone can be resorbed and its calcium withdrawn while dentin does not show such capacity. In this connection he also pointed out the absence of vascular paths by which calcium might be withdrawn from the dentin.

Strong negative evidence showing that teeth do not constitute a reserve supply of calcium has come from recent clinical studies on hyperparathyroidism. Thoma [8] made a histologic study of two premolars and one molar obtained from a boy 15 years of age who had a parathyroid tumor, a condition which is known to decalcify bone. He found no evidence of resorption in the teeth.

Albright, Aub and Bauer [9] examined the roentgenograms of jaws of patients who had parathyroid tumors and showed marked withdrawal of calcium from the bones. They concluded:

> The teeth do not take part in the generalized decalcification. They may fall out because of disease of the jaws but they themselves remain well calcified. This is brought out strikingly by roentgenograms in which the well calcified teeth stand out sharply against the poorly calcified jaws. This failure of the teeth to become decalcified is strong evidence against their being a reserve supply of calcium.

In an analysis of experimental hyperparathyroidism produced in normal rats by multiple injections of parathyroid extract, Schour, Tweedy and McJunkin [10] found evidence of withdrawal of calcium from the alveolar bone. This bone showed prominent osteoclastic activity. The molars as well as the incisors which could be seen in the same fields showed no osteoclasts or loss of calcium.

In a recent experimental study of the changes in the incisor of the rat following parathyroidectomy, the most severe histopathologic changes were found in series of parathyroidectomized rats that were subjected to repeated pregnancies and lactations (Schour, Chandler and Tweedy [11]). The much greater drain on calcium than would be obtained by parathyroidectomy alone was probably chiefly responsible for the more severe reaction. The experiments indicate that the severe reaction in the incisor resulted because much less calcium was available to the growing and calcifying tooth than would have been available under the condition of parathyroidectomy alone. If withdrawal of calcium were responsible for the disturbed calcification in the incisor, a similar disturbance should be recognizable in the molars. The latter showed normal calcification because they had completed their formation and calcification before or soon after parathyroidectomy.

The facts found in previous investigations harmonize with Erdheim's [12] calcioprotective law. According to this law, disturbances in calcium metabolism do not affect the various tissues of the body to an equal extent. Some tissues are less readily disturbed than others and possess a greater degree of protection against disturbances in calcification. Dentin and enamel thus are protected against loss of calcium.

Secondary Dentin and Secondary Calcification.—Lest it be thought that the dentin of the adult tooth is not subject to any change, it must be pointed out that it is capable of reacting to stimuli and injuries from without by means of formation of secondary dentin or sclerosis (Beust [13]) and of becoming more densely calcified with age (secondary calcification). Fish [14] has described the constant occurrence of an imper-

6. Eustachius, cited by Eidmann, Hermann: Die Entwicklungsgeschichte der Zähne des Menschen, Berlin, H. Meusser, 1923.

7. Hunter, John: Natural History of the Human Teeth, 1771, and Pathology of the Teeth, 1778, in Ottley, Drewry: The Life and Works of John Hunter, Philadelphia, Hoswell, Barrington and Hoswell, 1839.

8. Thoma, Kurt H.: Clinical Pathology of the Jaws, Springfield, Ill., Charles C. Thomas, Publisher, 1934.

9. Albright, Fuller; Aub, J. C., and Bauer, Walter: Hyperparathyroidism: A Common and Polymorphic Condition as Illustrated by Seventeen Proved Cases from One Clinic, J. A. M. A. **102:** 1276 (April) 1934.

10. Schour, Isaac; Tweedy, W. R., and McJunkin, F. A.: The Effect of Single and Multiple Doses of the Parathyroid Hormone on the Calcification of the Dentin of the Rat Incisor, Am. J. Path. **10:** 321-342 (May) 1934.

11. Schour, Isaac; Chandler, S. B., and Tweedy, W. R.: Changes in the Teeth Following Parathyroidectomy: I. The Effects of Different Periods of Survival, Fasting, and Repeated Pregnancies and Lactations on the Incisor of the Rat, Am. J. Path. **13:** 945-970 (Nov.) 1937.

12. Erdheim, J.: Rachitis und Epithelkörperchen, Denkschr. d. k. Akad. d. Wissensch. math. naturw. Klasse **90:** 363-688, 1914.

13. Beust, T. B.: Reaction of the Dentinal Fibril to External Irritation, J. Am. Dent. A. **18:** 1060 (June) 1931.

14. Fish, E. W.: The Pathology of the Dentin and the Dental Pulp, Brit. Dent. J. **53:** 351-363, 1932.

meable barrier of lime salts between a peripheral lesion of the dentin and the pulp. This calcific barrier is either a translucent zone of hypercalcified dentin immediately below the lesion first described by Tomes [15] or secondary dentin, which Fish regards as a calcific scar laid down at the pulpal margin to seal off a tract of injured and dead tubules.

Pathologic Calcification.—A number of alterations in calcification are associated with the teeth and their investing tissues, and they present interesting problems for investigation. These pathologic calcifications in many instances show typical Liesegang ring phenomena that are similar to those observed in the normal calcification of the dentin matrix (fig. 1). In a recent study on salivary calculus of the submaxillary gland, Berger and Berke [16] pointed out that Liesegang rings were observed in the central portions of the calculi and that the outer crust consisted of concentric layers of calcified substance closely resembling that of cortical bone. These authors also stated that the histologic picture seen in coronal calculus is similar to that observed in the submaxillary gland.

The calcification of the so-called false denticles of the pulp also occurs along a pattern resembling that of the Liesegang rings. They are formed by a concentric deposition of consecutive layers of calcium salts around a central nucleus which frequently is the result of hyaline degeneration of an area of the pulp.[17] Concentric bodies of calcification which are found occasionally at the distal pulpal slit of the rat incisor and increase in number and size after parathyroidectomy (fig. 2) and hypophysectomy also appear to exhibit the Liesegang ring phenomena. Pathologic calcification of

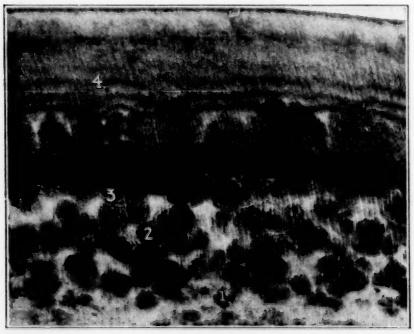


Fig. 1.—The labial dentin of a rachitic rat showing the various steps in the formation of the incremental striations: (1) first stage in the formation of calcospherites, (2) calcospherites showing Liesegang ring phenomenon, (3) beginning of coalescence of calcospherites and (4) completely coalesced calcospherites resulting in the incremental striations.

the fibers of the periodontal membrane and ankylosis of submerged teeth are additional conditions which await further investigation for a fundamental understanding of their etiology.

Caries and Tooth Structure.—It has been claimed that faulty calcium metabolism is conducive to caries because it results in defective structure, which in turn is more susceptible to decay. That faulty calcium metabolism produces defectively calcified structures in growing teeth is well established both clinically and experimentally. There is, however, no evidence that the quality of the calcified structure of the tooth has a significant role in the incidence of caries.

Weaver [18] pointed out the interesting fact that in school children a large proportion of second deciduous molars are carious on the mesial surface at the age of 5,

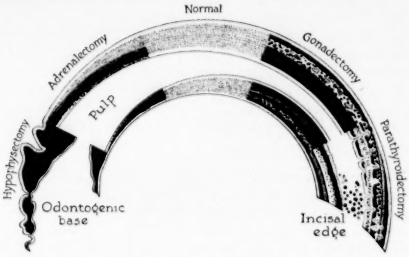


Fig. 2.—A composite diagram of the different levels of the labial (convex) and the lingual (concave) portion of the dentin of the incisor of the white rat. The labial and the lingual dentin are separated in the center by the pulp. The sections indicate the characteristic disturbances in the formation and the calcification pattern of the dentin in particular endocrine dysfunctions. This diagram shows the kymographic quality of the dentin. The changes in gonadectomy were found only in the ground squirrel.

while at that age caries is rare on the distal surface of the same tooth. This striking difference in relative liability to caries of the mesial and the distal surface of the same tooth cannot be explained on the basis of a difference in structure. Weaver traced the difference in reaction to a difference in the opportunity for stagnation of carbohydrate. The contact point between the first and the second deciduous molars is favorable for stagnation, while prior to the eruption of the first permanent molar the distal surface of the second deciduous molar is exempt from stagnation.

The investigations of Black,[19] Türkheim,[20] Kanthak [21] and Arnim [22] do not support the view of Mellanby [23] that defective structure is a primary cause of caries. Mottled enamel, which is a structural and chemical defect, shows no special susceptibility to caries.[24] Hypoplastic defects run in harmony with the incremental growth pattern. Caries, on the other hand, is found in zones which do not correspond with growth zones but is usually associated with pits, fissures and surfaces that are not readily cleaned during mastication.

It is significant that the molars of rats, which often show extensive and ravaging decay, reveal good formation and calcification in histologic sections. It is equally significant that the animals that suffered severe disturbances in calcification, as from parathyroidectomy and fluorosis, showed no greater incidence of caries in the molars than did the control animals.

15. Tomes, John: Dental Physiology and Surgery, London, John W. Parker, 1848.
16. Berger, Adolph, and Berke, J. D.: Calculus of the Submaxillary Gland, J. Am. Dent. A. **23:** 1397-1418 (Aug.) 1936.
17. Kronfeld, Rudolph: Histopathology of the Teeth and Their Surrounding Structures, Philadelphia, Lea & Febiger, 1933.
18. Weaver, R.: The Relative Importance of Various Factors in the Etiology of Caries, Ber. IX Internat. Zahnärzten Kongr., part 1, **1:** 377-394, 1936.
19. Black, G. V.: Physical Characteristics of Human Teeth and Their Relation to Their Diseases, Dental Cosmos **37:** 353-421, 1895.
20. Türkheim, H.: Caries forschung, Fortschr. d. Zahnheilkunde **6**(4)**:** 312-316, 1930.
21. Kanthak, F. F.: Velocity of Solubility of Various Samples of Dental Enamel, J. Dent. Research **14:** 21-28, 1934.
22. Arnim, S. S.; Aberle, S. D., and Pitney, E. H.: Dental Changes in Indian Children, J. Am. Dent. A. **24:** 478-480 (March) 1937.
23. Mellanby, May: Influence of Diet on Caries in Children's Teeth, Medical Research Council, Special Report Series, No. 211, London, 1936.
24. McKay, F. S.: The Establishment of a Definite Relation Between Enamel That Is Defective in Its Structure, as Mottled Enamel, and the Liability to Decay, Dental Cosmos **71:** 747-755 (Aug.) 1929.

The available evidence indicates that disturbances in calcium metabolism do not have a significant role in the etiology of caries.

Caries and Pregnancy.—Clinical evidence does not support the popular saying "A tooth for every child." Carefully controlled clinical studies and careful statistical analysis have shown that pregnancy per se is not conducive to caries. Statistical clinical investigations have shown that the incidence of caries in pregnant women is no greater than in nonpregnant women of corresponding ages.[25]

CALCIUM METABOLISM AND THE GROWING TOOTH

In direct contrast to the high stability and the relative insensitivity of the adult tooth, opposite conditions present themselves in regard to teeth that are still growing and calcifying.

The Growing Tooth as a Kymograph.—Erdheim [26] has justly compared the calcifying dentin of the incisor of the rat to the drum of a kymograph, on which vacillations in calcium metabolism are recorded in an accurate and easily readable manner. Schour and Smith [27] have shown an equally high degree of sensitivity in the calcifying enamel of rats by means of the administration of fluorine. More recently, Schour and Poncher [28] have been able to show that Erdheim's analogy applies to the growing enamel and dentin of the human tooth as well as to those of the rodent incisor. In a number of delicate experimental attacks that involve modifications in calcium metabolism, the calcifying dental tissues will show clean-cut responses that are not recognizable in any other tissues (figs. 2 and 3).

Methods Used in the Study of the Calcification of Teeth.—While it is possible to recognize, by an indirect approach, different degrees of calcification in stained sections of decalcified enamel and dentin, a satisfactory staining method of ground sections is not yet known. Staining methods with silver nitrate [29] or alizarin [30] hold some promise and merit further application and investigation.

There is urgent need for the discovery of new methods and the application and improvement of available methods for the purpose of analyzing quantitative and qualitative differences in the calcification of the hard dental tissues. Important results have already come from the use of soft x-rays [31] (fig. 4), microhardness tests,[32] microchemical analysis [33] and x-ray diffraction studies.[34] The application of micro-incineration in dental research also gives promise of significant results.

The Normal Process of Calcification.—Little is known regarding the chemistry of calcification in general, and even less is known regarding the chemical processes in the calcification of the dental tissues. The work of Van Slyke and Peters [35] and the recent volumes of the "Annual Review of Biochemistry" [36] contain a general survey on calcification.

The enamel is a cuticular secretion of the ameloblasts which later becomes impregnated with lime salts. Von Ebner [37] described the following stages in the calcification of enamel: primary, young, transitional and fully matured. Chase [38] confirmed and extended these conclusions. The enamel in the first three stages is acid resistant. The fully matured enamel is acid soluble.

Dentin consists of a collagenous matrix in which lime salts are embedded. The calcification of dentin proceeds along an incremental pattern at rhythmic intervals of 16 microns.[39] There is a small time difference in which formation precedes calcification. As the dentin-forming cells recede pulpally and migrate distally, they continually form new dentin matrix while the matrix formed on the previous day is calcifying.

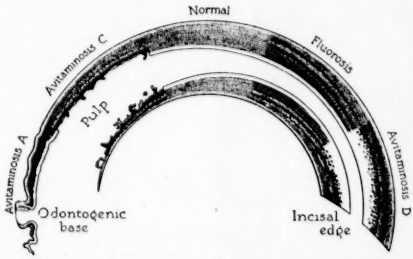


Fig. 3.—A composite diagram of the different levels of the labial (convex) and the lingual (concave) portion of the dentin of the incisor of the white rat. The labial and lingual dentin are separated in the center by the pulp. The sections indicate the characteristic disturbances in the formation and the calcification pattern of the dentin associated with particular dietary interferences. This diagram shows the kymographic quality of the dentin.

The matrix is calcified in the form of calcospherites [40] which follow the typical Liesegang ring formation;[41] when one globule enters the sphere of influence of another a fusion occurs (fig. 1). Normally calcified dentin appears homogeneous because of complete fusion of a large number of spherical areas. Even in the normal condition, however, the successive layers of the dentin are not equally well calcified. Well calcified layers, which stain more readily with hematoxylin, alternate regularly and rhythmically with less well

25. Ziskin, D. E.: The Incidence of Dental Caries in Pregnant Women, Am. J. Obst. & Gynec. **12:** 710-719 (Nov.) 1926. Starobinsky, I.: Beobachtungen über Zahncaries bei Schwangeren, Deutsche Monatschr. f. Zahnhlk. **47:** 238-244, 1929. Mull, J. W.; Bill, A. H., and Kinney, F. M.: Variations of Serum Calcium and Phosphorus During Pregnancy: II. Effect on Occurrence of Dental Caries, Am. J. Obst. & Gynec. **27:** 679-683 (May) 1934. Klein, H.: The Effects of Pregnancy on the Incidence of Tooth Decay, Dental Cosmos **77:** 864, 1935.

26. Erdheim, J.: Ueber die Dentinverkalkung im Nagezahn bei der Epithelkörperchentransplantation, Frankfurt Ztschr. f. Path. **7:** 295, 1911.

27. Schour, Isaac, and Smith, Margaret C.: Mottled Teeth: An Experimental and Histologic Analysis, J. Am. Dent. A. **22:** 796-813 (May) 1935.

28. Schour, Isaac, and Poncher, Henry G.: Rate of Apposition of Enamel and Dentin, Measured by the Effect of Acute Fluorosis, Am. J. Dis. Child. **54:** 757 (Oct.) 1937.

29. Williams, J. L.: Disputed Points and Unsolved Problems in the Normal and Pathological Histology of Enamel, J. Dent. Research **5:** 27-116, 1923.

30. Gottlieb, B.: Untersuchungen über die organische Substanz im Schmelz Menschlichen Zähne, Oesterr.-ungar. Vrtljschr. f. Zahnh., vol. 31, No. 1, 1915.

31. Applebaum, E.; Hollander, F., and Bodecker, C. F.: Normal and Pathological Variations in Calcification of Teeth as Shown by the Use of Soft X-Rays, Dental Cosmos **75:** 1097-1105, 1933.

32. Hodge, H. C.: Microhardness Studies of Dentin, J. Dent. Research **15:** 156-157 1935.

33. LeFevre, Marian L.; Bale, W. F., and Hodge, H. C.: The Chemical Nature of the Inorganic Portion of Fetal Tooth Substance, J. Dent. Research **16:** 85-101, 1937.

34. Van Huysen, G.; Bale, W. F., and Hodge, H. C.: Comparative Study of X-Ray Absorption Properties of Normal and Pathological Dentin by Densitometric and Ionization Methods, J. Dent. Research **14:** 168-169, 1934.

35. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, 1931.

36. Annual Review of Biochemistry, edited by J. W. Luck, San Francisco, Stanford University Press, 1932.

37. von Ebner, V.: Ueber die histologischen Veränderungen des Zahnschmelzes während der Erhartung, insbesondere beim Menschen, Arch. f. mikr. Anat. **67:** 18, 1906.

38. Chase, S. W.: The Nature of the Enamel Matrix at Different Ages, J. Am. Dent. A. **22:** 1343-1352 (Aug.) 1935.

39. Schour, Isaac, and Hoffman, M. M.: Demonstration of a 16 Micra Rhythm in the Stratification of Enamel and Dentin in Man and Other Mammals, J. Dent. Research **15:** 161, 1935.

40. Harting, P.: On the Artificial Production of Some of the Principal Organic Calcareous Formations, Quart. J. Micr. Sc. **20:** 118-123, 1872.

41. Thompson, D'Arcy W.: On Growth and Form, London, Cambridge University Press, 1917.

calcified layers, which stain more readily with eosin. Thus there arises in the dentin a stratification which consists of pairs of dark and light increments. These pairs are of uniform width (approximately 16 microns) and give the dentin its regular and characteristic incremental calcification. The dentin immediately next to the pulp consists of the newly formed matrix, which is not yet calcified and is called the predentin.

When the globular calcification is incomplete, the areas of dentin between the globules take an eosin stain and constitute interglobular dentin.

The normal process of secondary calcification which parallels the dentinal tubules results in an increased deposition of calcium which is in direct proportion to the age of the particular dentin increment.[42]

Histophysiologic Aspects of Calcification.—Recent investigations have pointed out several histophysiologic processes concerning the calcification of teeth.

Calcification Rhythm: A series of experimental studies established the existence of a common and basic calcification rhythm in the enamel and the dentin of teeth of mammals and man.[39] This rhythm recurs in units of 16 microns and constitutes a twenty-four hour phenomenon in the rodent incisor [43] and a much slower process in the monkey and in man.[44]

Fig. 4.—Transverse ground section as shown by grenz rays of an albino rat which was given eight injections of sodium fluoride at forty-eight hour intervals. The primary effects of the injections are shown by the radiolucent lines and the secondary effects by the radiopaque lines. Note the radiopacity of the enamel labial to the dentin. This photomicrograph was taken by Dr. Edmund Applebaum of the Oral Histology Department of Columbia University.

The Neonatal Ring and the Calcification Pattern: Another advance in our knowledge is the recent discovery of the neonatal ring,[45] which records in the human deciduous tooth the biologic changes that the new-born infant experiences during its effort to adjust from an intra-uterine to an extra-uterine existence.[46]

This discovery automatically constitutes the first important stepping stone to the recognition and analysis of a constant calcification pattern that is superimposed on the basic 16 micron rhythm and that is associated with broader constitutional periods and adjustments, such as birth or weaning. The neonatal ring serves as a biologic landmark which separates prenatal and postnatal calcification in teeth. The prenatal portions of enamel and dentin appear to be denser than the postnatal portions. This is understandable when one considers that the child in utero takes all the calcium that it requires for its teeth and bones, even at the expense of the mother's calcium. It acts as a scavenger. However, after birth such an equilibrium is not controllable by physiologic mechanisms but is to a good extent dependent on the infant's qualitative and quantitative intake of calcium in the diet.

Experimental studies conducted mainly in the last five years have pointed out a number of factors that influence the calcification of growing teeth. These factors may be classified into two groups, endocrine and dietary.

INFLUENCE OF THE ENDOCRINE ORGANS ON CALCIFICATION

The Parathyroids.—These glands appear to be the most important endocrine organs as far as calcium metabolism is concerned. Their removal disturbs the calcification of the dentin in a characteristic manner and also produces enamel hypoplasia (fig. 2). Erdheim's [47] original announcement of his observations stimulated Fleischmann [48] to conduct a comprehensive clinical study of defects in the enamel of children's teeth. He found that many instances of enamel hypoplasia were associated with a history of tetanic convulsions. The latter are often manifestations of underfunction of the parathyroids.

A recent investigation [11] on the effects of parathyroidectomy on the incisors of over 100 rats and their modifications after periodic fasting or repeated pregnancies and lactations showed the delicate response of the dentin to these experimental alterations. Fasting every seventh day accentuated the typical parathyroprivic changes. Repeated pregnancies and lactations produced the most severe alterations. However, in no instance was there histologic evidence of withdrawal of calcium from the teeth.

Erdheim [26] in 1911 succeeded in removing the parathyroids and transplanting them in the same animal. He was able to demonstrate that the dentin that was formed during the time that elapsed between the removal of the glands and the vascularization of the transplant was not calcified. He was so impressed with the delicacy of this reaction that he was prompted to compare the dentin of the incisor of the rat to a kymograph which records changes in calcium metabolism.

Experimental Hyperparathyroidism: The effect of single injections of parathyroid extract on calcification in the normal animal was studied by Schour and Ham.[49] The blood calcium level was found to rise above normal at first and then return to normal. Histologic study showed that the dentin formed during the rise was poorly calcified (primary reaction) and that the dentin formed during the fall was excessively calcified (secondary reaction).

In another study [10] in which multiple injections of parathyroid extract were administered, similar changes were observed in the dentin. In addition the alveolar bone showed osteoclastic activity and fibrous changes in the bone marrow.

Clinical Hyperparathyroidism: Recent clinical studies of the dental changes associated with hyperparathyroidism confirm the experimental observations in respect to the changes in the alveolar bone. Borg [50] cited in addition to his own clinical case fourteen others in

42. Hollander, Franklin: Study of Dental Calcification by Means of X-Ray Absorption Coefficients, J. Dent. Research **15**: 365, 1936.
43. Schour, Isaac, and Hoffman, M. M.: Experimental Demonstration of the Daily Apposition of 16 Micra of Enamel and Dentin in Growing Mammalian Teeth, J. Dent. Research **15**: 161-162, 1935.
44. Schour, Isaac, and Massler, M.: The Rate and Gradient of Growth in Human Deciduous Teeth with Special Reference to the Neonatal Ring, J. Dent. Research **16**: 349, 1937.
45. Schour, Isaac: The Neonatal Line in the Enamel and Dentin of the Human Deciduous Teeth and First Permanent Molar, J. Am. Dent. A. **23**: 1946-1955 (Oct.) 1936.
46. The Neonatal Line in Human Growth, editorial, J. A. M. A. **108**: 807 (March 6) 1937.
47. Erdheim, J.: Tetania Parathyreopriva, Mitt. a. d. Grenzgeb. d. Med. u. Chir. **16**: 632-744, 1906.
48. Fleischmann, L.: Virchschr. f. Zhlk. **25**: 868, 1909.
49. Schour, Isaac, and Ham, A. W.: The Action of Vitamin D and of the Parathyroid Hormone on the Calcium Metabolism as Interpreted by Studying the Effect of Single Doses on the Calcification of Dentin, Arch. Path. **17**: 22-39 (Jan.) 1934.
50. Borg, J. F.: Hyperparathyroidism, a New Consideration for the Dentist, J. Am. Dent. A. **22**: 1683-1693 (Oct.) 1935.

V 1
193

which oral symptoms occurred from six months to six years or more previous to the final diagnosis of hyperparathyroidism.

Borg pointed out that early recognition on the part of the dentist of the possible diagnosis of hyperparathyroidism and his reference of the patient for a medical examination might have saved many teeth that were extracted and resulted in the prompt treatment of the underlying disturbance.

A roentgenogram of the jaws often shows osteoporotic changes in the early stages and a granular and mottled appearance in the later stages.

Additional symptoms may be cysts and giant cell tumors. The latter tend to recur after surgical removal as long as the parathyroid tumor persists. The teeth may become loose as a result of the active resorption of the alveolar bone. They have often been extracted unnecessarily, because in other cases prompt diagnosis and surgical removal of the parathyroid tumor have resulted in recovery of the bone and tightening of the teeth.[51]

Hypophysis.—The removal of the hypophysis produces among other distinct alterations, such as marked retardation of eruption, a disturbance in calcification[52] (fig. 2). The indications are that the calcification is denser than normal. It is difficult to establish the reason for this condition. It is possible that the retarded eruption permits the dentin to be calcified for a longer period, so that it receives more calcium by means of secondary calcification.

After hypophysectomy, the involvement of other endocrine glands, particularly the parathyroids and the adrenals, plays a part in the dentin picture. In some cases the predentin area of the most recently formed dentin shows many fine isolated dentin globules. They remind one of the characteristic sprinkling seen in the predentin of adrenalectomized rats[53] and suggest the possible influence of the atrophic changes of the adrenals that occur after hypophysectomy. To what extent the denser calcification may be associated with an alteration of the functional activity of the parathyroids is not known.

Gonads.—Changes in the teeth of eunuchs have not been reported in the literature. This is not surprising, since practically all castrations were performed not soon after birth but at a time when the development of the teeth was practically completed. In a recent study, however, the incisors of castrated or ovariectomized ground squirrels revealed prominent disturbances in calcification which could be recognized in 54 per cent of the cases in roentgenograms and in 91 per cent of the microscopic sections[54] (fig. 2).

Adrenals.—Examination of the incisors of completely adrenalectomized rats show characteristic changes in the calcification of the dentin.[54] The dentin shows a denser calcification, and the predentin is sprinkled with hematoxylin-staining globules (globular predentin; fig. 2).

It is interesting to note that practically every endocrine gland which has been found to produce characteristic effects on the teeth is also exerting an influence on the calcification of the teeth. By examining the nature of the disturbance in calcification, it is often possible to tell which endocrine gland was disturbed without the knowledge of the experimental records. Figure 2 shows in a diagrammatic manner the characteristic differences in the dentin of the incisor of the rat associated with particular endocrine interferences.

INFLUENCE OF THE VITAMINS ON CALCIFICATION

The sensitive response of the tooth to endocrine disturbances is closely rivaled by its response to vitamin deficiencies (fig. 3). The influence of vitamin D on dental calcification is well known. The association of vitamin D and rickets is well established, although the pathogenesis of rickets is still being actively investigated in a number of research laboratories.

Schour and Ham[49] studied the effect of single administrations of viosterol (irradiated ergosterol) on the dentin of the rat incisor. The effects were similar to those obtained with single injections of parathyroid extract; namely, a primary reaction in the form of a poorly calcified dentin stripe, which seemed to be related to the rise of the blood calcium content, and a secondary reaction in the form of a well or excessively calcified dentin stripe, which seemed to be related to the return of the blood calcium to normal.

The delicacy of the response of dentin to vitamin D deficiency can be illustrated by the following experience. In a study in which Margaret Smith and I[27] collaborated, some of the control animals which she sent to our laboratory showed a picture of interglobular dentin beyond normal range. This was at first disconcerting, because adequate controls constitute a primary essential in each experimental investigation. I suspected that the basal diet was slightly deficient in vitamin D. On further investigation it was found that whole milk was the only source of vitamin D and that for this group of animals such an amount was not sufficient. The fortification of the diet with a few drops of viosterol corrected the calcification of the dentin and solved our problem of establishing the proper control picture.

The clinical problem of preventing the effects of vitamin D deficiency in growing teeth is not serious today. As a result of education, the beneficial effects of cod liver oil are well appreciated by the public. In fact, the problem may be how to be cautious against the possible effects of hypervitaminosis D. While cod liver oil has been a safe source of vitamin D, the dangers of careless and too liberal use of concentrates must be considered.

Calcification is also disturbed by other vitamin deficiencies. In the incisors of rats placed on diets deficient in vitamin A, abnormal calcification occurs in the pulp[55] (fig. 3), and prominent interglobular dentin is common in the labial dentin.[56]

Calcification of the predentin zone is one of the characteristic changes of vitamin C deficiency in guinea pigs[57] (fig. 3). The recognition of the sensitivity of the incisor of the guinea pig to vitamin C deficiency has paved the way for the biologic method of assaying

51. Barr, D. P., and Bulger, H. A.: The Clinical Syndrome of Hyperparathyroidism, Am. J. M. Sc. **179:** 449-476 (April) 1930.

52. Schour, Isaac, and van Dyke, H. B.: Changes in the Teeth Following Hypophysectomy, Am. J. Anat. **50:** 397-433 (July) 1932. Schour, Isaac: The Hypophysis and the Teeth: I. Changes in the Rat Incisor Following Hypophysectomy, Angle Orthodontist **4:** 3-21 (Jan.) 1934.

53. Schour, Isaac, and Rogoff, J. M.: Changes in the Rat Incisor Following Bilateral Adrenalectomy, Am. J. Physiol. **116:** 334-344 (April) 1936.

54. Schour, Isaac: Changes in the Incisor of the Thirteen-Lined Ground Squirrel (Citellus Tridecemlineatus) Following Bilateral Gonadectomy, Anat. Rec. **65:** 177 (May 25) 1936.

55. Wolbach, S. B., and Howe, P. R.: The Incisor Teeth of Albino Rats and Guinea Pigs in Vitamin A Deficiency and Repair, Am. J. Path. **9:** 275 (May) 1933.

56. Schour, Isaac, and Smith, Margaret C.: Changes in the Rat Incisor Following Vitamin A Deficiency, to be published.

57. Höjer, A.: Effects of Vitamin C Deficiency on Guinea Pig Teeth, Acta Paediat. (supp.) **3:** 8, 1924. Boyle, P. E.; Wolbach, S. B., and Bessey, O. A.: Histopathology of Teeth of Guinea Pigs in Acute and Chronic Vitamin C Deficiency, J. Dent. Research **15:** 331-332, 1936.

110
938

the Vitamin C content of foods. Fish and Harris [58] made a critical analysis of the disturbances in the calcification of dentin in vitamin C deficiency.

THE EFFECT OF FLUORINE—MOTTLED TEETH

Little is known of the influence of deficient or excessive amounts of particular inorganic or organic elements in the diet. A study of the influence of heavy metals, such as lead, aluminum and selenium, gives promise of significant results. In contrast to our extremely limited or lack of knowledge of these factors, our present knowledge on the influence of fluorine is considerable.

The Cause of Mottled Enamel.—For many years a type of enamel hypoplasia known as mottled enamel was a challenging problem to the dental profession. The condition was endemic and characterized by a destructive chalky opacity and pitting of the enamel. Black and McKay [59] first attempted to elucidate the underlying cause of this dental defect and were instrumental in initiating the large amount of research that followed. In 1931 Churchill [60] suggested and Smith [61] established independently by animal experiments that chronic fluoride intoxication is the direct cause of mottled enamel.

Smith and her co-workers [62] succeeded in reproducing the mottling of teeth in rats by adding to their diet concentrates of water from the communities in which mottled enamel was endemic. Following a suggestion by McCollum,[63] they were able to reproduce the same condition by adding sodium fluoride to the diet. An analysis of the water from the communities in which the condition was endemic revealed a high content of fluorine.

After the proof was established that mottled enamel is caused by the toxic action of fluorides in water, the next step was to investigate the mechanism by which fluorine disturbed the teeth. Here again animal experimentation proved to be necessary and enlightening.

Histologic Analysis of Dental Changes.—The dental changes produced by fluorides given to animals in their diet or administered by injections were then subjected to histologic analysis [64] (fig. 4). The dietary experiments showed disturbances in the calcification of the dentin as well as the enamel (fig. 3). It seemed therefore that a better and more inclusive term for the mottled condition would be "mottled teeth" rather than "mottled enamel." The injection experiments produced sharp effects that were easily recognized as bands of defective pigmentation and calcification in the enamel. These changes could be seen with the naked eye, so that any one could tell the number of injections given to an animal by counting the bands on the enamel surface. The microscopic sections of the teeth showed corresponding bands of disturbed calcification in the dentin. In cross sections these appeared in the form of concentric rings (fig. 4) similar to those seen in the tree. Further microscopic analysis shows that the effect of each injection consists of an imperfect hypocalcified layer in the dentin and in the enamel. A secondary recovery reaction follows the first and is evidenced as a normal or hypercalcified layer.

The Sensitivity of the Enamel-Forming Cells to Fluorides.—The enamel-forming cells (ganoblasts, or ameloblasts) are the first cells to be affected. In rats the effect can be recognized histologically in the enamel-forming cells within one hour after a single injection. By the effect on the cell, the formation of the enamel is disturbed. The disturbance in calcification which occurs at the same time is probably brought about by the deposition of calcium fluoride in the tissue instead of the normal calcium salts (PO_4 or CO_3) and possibly also by a disturbance of the enzymatic phosphatase system concerned in calcification.[65]

The experiments thus showed that the effect of the fluorides was prompt and localized first in the formative organ of the tooth.

The effects of chronic fluorine intoxication on bone development, enzymatic action, body growth, respiration and reproduction are striking and destructive.[65] These effects, however, are produced only by increased doses of sodium fluoride. The growing tooth is the first and the most delicate organ to react to the ingestion of fluorides.

Recent Developments in Our Knowledge of Mottled Teeth.—More recently there have been several interesting developments in our knowledge concerning fluorosis and mottled teeth. Neff [66] has suggested a method whereby the fluorine content of a given water supply can be determined by the microscopic study of the teeth of fish that are allowed to live in that medium.

Brinch and Roholm [67] discovered mottled enamel in the teeth of two children of a woman who suffered from chronic fluoride poisoning contracted during her work in an industrial plant which used cryolite (Na_3AlF_6). The prolonged nursing of these children with their mother's milk affected the permanent teeth. This interesting observation has been confirmed by the Smiths,[68] who found severe mottling of the enamel of temporary teeth of breast-fed infants in communities where the fluorine content of the water supply was exceedingly high.

They also found mottled deciduous teeth in children who were artificially fed with milk that was diluted with water containing a high fluorine content (twelve or more parts per million). This fact raises an interesting question. Why are deciduous teeth not susceptible to fluorine except in doses that are considerably higher than those sufficient to produce the mottled condition in permanent teeth? Smith suggested the possibility that calcification proceeds more rapidly in the temporary than in the permanent teeth. It is also possible that the proportion of fluorine-containing foods is smaller in the diet of the infant than in that of the older child. The prevention of the dental effects of fluorosis presents an important problem in public health.

58. Fish, E. W., and Harris, L. J.: Effects of Vitamin C Deficiency on Tooth Structure in Guinea Pigs, Brit. Dent. J., January 1935.

59. Black, G. V., and McKay, F. S.: Mottled Teeth: An Endemic Developmental Imperfection of the Enamel of the Teeth Heretofore Unknown in the Literature of Dentistry, Dental Cosmos **58**: 129-156, 1916.

60. Churchill, H. V.: The Occurrence of Fluorides in Some Waters of the United States, J. Am. Water Works Association **23**: 1399-1407 (Sept.) 1931.

61. Smith, Margaret C.; Lantz, Edith M., and Smith, H. V.: The Cause of Mottled Enamel, Science **74**: 244 (Sept. 4) 1931.

62. Smith, Margaret C., and Lantz, Edith M.: Experimental Production of Mottled Enamel, Technical Bulletin 45, University of Arizona, Agricultural Experiment Station, January 1933.

63. McCollum, E. V.; Simmonds, Nina, and Becker, E. J.: The Effect of Additions of Fluorine to the Diet of Rats on the Quality of Their Teeth, J. Biol. Chem. **63**: 553 (April) 1925.

64. Schour, Isaac, and Smith, Margaret C.: The Histologic Changes in the Enamel and Dentin of the Rat Incisors in Acute and Chronic Experimental Fluorosis, Technical Bulletin 52, University of Arizona, Agricultural Experiment Station, June 15, 1934, pp. 69-91.

65. DeEds, Floyd: Chronic Fluorine Intoxication, Medicine **12**: 1 (Feb.) 1933.

66. Neff, Andrew: The Effect of Fluorosis in Natural Waters on the Teeth of Small Fish, Science **82**: 301-302 (Sept. 27) 1935.

67. Roholm, K., and Brinch, O.: Zwei Fälle von Mottled Enamel nach chronische fluornorgiftung der Mutter, Paradentium **6**: 147, 1934.

68. Smith, Margaret C., and Smith, H. V.: The Occurrence of Mottled Enamel on the Temporary Teeth, J. Am. Dent. A. **22**: 814-817 (May) 1935.

REACTION OF DENTIN TO VARIOUS DISTURBANCES IN CALCIUM METABOLISM

The Calciotraumatic Ring.—A prompt and acute response in the dentin has been observed repeatedly in association with the effects of injections of parathyroid extract [10] or sodium fluoride.[27] The immediate primary hypocalcified zone following the injection of sodium fluoride may often be readily demarcated from the preexperimental dentin by a fine narrow hematoxylin-staining zone, which facilitates the recognition of the starting point for measuring the width of postoperative dentin.

This acute response of dentin offers an interesting problem for analysis. It seems to be an expression of a shock to calcium metabolism. This may be induced by the trauma incident to surgical intervention, anesthesia or acute endocrine disturbances. It may be an effect of overcalcification associated with a brief period of arrested growth. Regardless of the particular source of this reaction, it may be considered an experimentally or otherwise induced effect of hypercalcification in the dentin. The ring itself might be referred to as the calciotraumatic dentin ring. It illustrates in an accentuated manner the normal dual character of the calcification of dentin, which consists of a rhythmic alteration of dense and less dense mineralization.

An analogous macroscopic condition has been observed in the roentgenograms of long bones which register transverse lines of arrested growth [69] or scars [70] in response to various acute disturbances.

IS CALCIUM THERAPY INDICATED?

The Council on Dental Therapeutics recently published a comprehensive report entitled "Calcium and Phosphorus Compounds in Dentistry," [71] in which its position against indiscriminate calcium therapy is shown to be well founded. I am in full agreement with this position.

On the basis of our present knowledge, calcium therapy in dentistry per se is not indicated. In cases in which the individual conditions might call for such therapy, on the basis of medical and systemic needs, the prescription should come from the physician. Aside from the fact that calcium therapy is not needed in the vast majority of cases, there is danger in the routine use because of the harm that may result. One instance that was reported to me by a well recognized pediatrician will illustrate the abuse to which calcium therapy may be subjected. This pediatrician was called by a frantic mother who reported that her little girl was unable to pass her feces and needed immediate help. The physician found that the feces was practically calcified, and he had to break up the mass in order to relieve the child. The clinical history showed that the family dentist had prescribed dicalcium phosphate to arrest caries in the teeth of the child. He did not prescribe the dose but told the mother that it was like candy and the child could eat all she wanted. In addition the child had suffered from slow bowel movement. The alkalis in the stools from the alkaline digestive juices of the bile and the pancreas united with the excess dicalcium phosphate to form insoluble calcium soaps. Three mistakes were made: The wrong treatment for caries was used, an inaccurate dosage was given and the child's general health was not considered.

GENERAL CONSIDERATIONS AND CONCLUSIONS

1. It is important to distinguish between the adult tooth, which is essentially completed in formation and calcification and is fully erupted, and the tooth that is still in a growing and formative stage. The biologic reaction of the tooth naturally varies with the different periods of its life span.

2. Present evidence establishes the fact that the adult and fully erupted tooth is as a whole not subject to modification in structure or calcification by changes in calcium metabolism. The calcium content of dentin may be slightly increased with age by secondary calcification. However, unlike bone, enamel and dentin are not storehouses of calcium and are not subject to withdrawal.

3. Present evidence has not established a correlation between calcium metabolism and caries and offers no factual basis for the view that the incidence of caries is increased because of the metabolic changes that occur during pregnancy. Clinical and statistical evidence shows a similar incidence of caries in pregnant women and in nonpregnant women of corresponding age.

4. The indications are that the response of the growing and calcifying tooth to changes in calcium metabolism induced by endocrine factors and vitamin and other dietary factors is characteristic and to some extent pathognomonic because the calcifying dental tissues are uniquely specialized and sensitive structures.

5. Most of the evidence on the delicate, accurate and prompt response of the calcifying tooth to calcium disturbances is derived from data obtained from animal experimentation, especially on the incisor of the rat, which is a tooth of continuous growth. Nevertheless, recent results of studies on human beings indicate that human teeth are also very sensitive and possess similar kymographic qualities.

6. The kymographic qualities of human teeth facilitate the analysis of the calcification pattern of teeth and constitute the basis for tooth ring analysis as an aid in the assessment of health and disease.

7. The employment of calcium therapy in dentistry per se is not justifiable. There is no evidence to show that alterations in calcium metabolism give rise to oral or dental disturbances without producing other systemic symptoms. When systemic manifestations are present, the responsibility for calcium therapy should rest with the physician.

1838 West Harrison Street.

69. Harris, H. A.: Bone Growth in Health and Disease, Oxford University Press, 1933.
70. Todd, T. W.: Mutilated Growth, J. Am. Dent. A. **21**: 479-488 (March) 1934.
71. Calcium and Phosphorus Compounds in Dentistry, Council on Dental Therapeutics, J. Am. Dent. A. **23**: 139-147 (Jan.) 1936.

Some Growth Studies Unreliable.—Many growth studies have been carried on by persons who have not been trained in the technic of anthropometry (which is by no means easy to acquire), and the measurements are consequently unreliable. The bulk of the subjects studied has not been assorted racially or even on the basis of national origins, so that the conclusions derived from the heterogeneous material are of dubious value. There are, of course, many exceptions to these generalizations, but, in my opinion, much of the effort expended in growth studies has been unintelligent and pointless. Such studies, unless undertaken for the simple purpose of demonstrating racial differences, should be so intimately associated with pediatrics as to furnish the controls and the knowledge of individual development with which to correlate the diseases and nutritional variations of childhood.—Hooton, E. A.: Apes, Men, and Morons, New York, G. P. Putnam's Sons, 1937, page 245.

THE USE OF HELIUM IN ANESTHESIA

URBAN H. EVERSOLE, M.D.
BOSTON

Helium is one of the most recent additions to the list of gaseous therapeutic agents. Its therapeutic use was first reported by Barach.[1] He obtained beneficial results frequently when helium was used in the treatment of patients in status asthmaticus who were completely refractory to epinephrine as well as in the treatment of patients suffering from severe asthma who were partially refractory to epinephrine. He has also reported favorable results when it was used in the treatment of obstructive lesions, usually of inflammatory origin, of the larynx, trachea and bronchi. Barach [2] has also employed helium and oxygen mixtures to advantage as substitutes for pure oxygen in the treatment of patients suffering from emphysema, bronchiectasis or pulmonary fibrosis.

The purpose of this paper is to present an additional group of cases in which helium was used clinically. The patients had various respiratory difficulties during the course of anesthesia.

HISTORY OF HELIUM

Helium, argon, krypton, neon and xenon comprise the "rare atmospheric gases." These five gases together constitute approximately 1 per cent of the atmosphere.

The bright yellow spectral line of helium was first observed in the solar spectrum by Jannsen [3] and Lockyer,[4] during an eclipse of the sun in 1868. Helium was discovered by Sir William Ramsay [5] in 1894, when he obtained it from the mineral cleveite. Its presence in the air was first demonstrated spectroscopically by Kayser in 1894, but the actual separation of helium from the air was first accomplished by Ramsay and Travers in 1895.[3] The quantity of helium in the air is small, only about one part in 185,000. Helium is present in much greater quantities in natural gases, where its percentage varies from 0.01 to 1.84. The natural gas richest in helium is found in Kansas, Oklahoma and Texas.

PROPERTIES

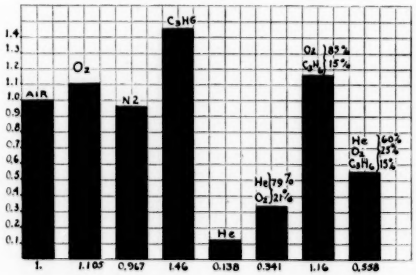
Helium is a colorless, odorless and entirely inert monatomic gas, with a molecular weight of 4 and a specific gravity compared with air of 0.138. It is therefore with the exception of hydrogen (molecular weight 2) the lightest element. A mixture of 21 per cent oxygen and 79 per cent helium has a specific gravity of 0.341; hence it is about one third as heavy as air. The specific gravity of oxygen is 1.105, while that of nitrogen is 0.967. Helium is noninflammable and nonexplosive. Since it is chemically inert it does not form compounds and has no positive valence. It is also, in all probability, physiologically inert.

In 1931 Hershey [6] reported that atmospheres from which the rare gases were excluded were incompatible with life. This observation was not corroborated by Barach.[7] He kept animals alive for as long as forty-two days, with no apparent harm, in atmospheres from which the rare gases had been excluded. Furthermore, he kept mice alive in completely sealed chambers containing 79 per cent helium and 21 per cent oxygen for as long as two months without any apparent injury. Orcutt and Waters [8] also reported that the elimination of the rare gases from atmosphere was not harmful to experimental animals.

CLINICAL USES

Since helium is entirely inert, the basis for its clinical use depends entirely on its physical properties of low specific gravity and rapid rate of diffusion.

It is approximately one eighth as heavy as oxygen and one seventh as heavy as nitrogen, while a mixture of 79 per cent helium and 21 per cent oxygen is about one third as heavy as air and slightly less than one third as heavy as pure oxygen. Hence, on the basis of the physical formula that F equals MA, where F is force, M is mass and A is acceleration, the force required to move a given volume of 21 per cent oxygen



The specific gravities of various gases and gaseous mixtures.

and 79 per cent helium should be approximately one third that required to move the same volume of air and slightly less than one third that required to move the same volume of pure oxygen. A mixture of 60 per cent helium, 25 per cent oxygen and 15 per cent cyclopropane has a specific gravity of 0.558, which is about one half that of a mixture of 85 per cent oxygen and 15 per cent cyclopropane (1.16).

The rate of flow of gases through narrow orifices is inversely proportional to the square root of their molecular weights. On this basis the rate of flow of a mixture of 79 per cent helium and 21 per cent oxygen through a narrow orifice should be about twice that of air. Therefore the addition of helium to any gas or mixture of gases will result in a lighter and more diffusible mixture, which will require less force (therefore less muscular effort) to be moved. Reasoning from another angle, the same force will move a larger volume of the mixture in a given length of time.

These peculiar physical properties led Barach to employ helium in the treatment of the various conditions previously mentioned. Also on the basis of these physical properties we have administered helium to patients in whom certain respiratory difficulties

From the Department of Anesthesia, the Lahey Clinic.

Read before the International Congress of Anesthetists, Chicago, Oct. 25, 1937.

1. Barach, A. L.: Use of Helium as a New Therapeutic Gas, Proc. Soc. Exper. Biol. & Med. **32**: 462-464 (Dec.) 1934.

2. Barach, A. L.: The Use of Helium as a New Therapeutic Gas, Anesth. & Analg. **14**: 210-215 (Sept.-Oct.) 1935; The Use of Helium in the Treatment of Asthma and Obstructive Lesions in the Larynx and Trachea, Ann. Int. Med. **9**: 739-765 (Dec.) 1935; The Therapeutic Use of Helium, J. A. M. A. **107**: 1273-1280 (Oct. 17) 1936.

3. Helium, Encyclopaedia Britannica, ed. 14, p. 400-402.

4. Lockyer, J. N.: The Story of Helium, Nature **53**: 343-346 (Feb. 13) 1896.

5. Ramsay, Sir William: Terrestrial Helium (?), Nature **51**: 543-544 (April 4) 1895.

6. Hershey, J. W.: Physiologic Effects of Atmospheres Diluted by Nitrogen, Tr. Kansas Acad. Sc. **32**: 51, 1929.

7. Barach, A. L.: Rare Gases Not Essential to Life, Science **80**: 593-594 (Dec.) 1934.

8. Orcutt, F. S., and Waters, R. M.: Possible Influence of Rare Gases on Physiology, Anesth. & Analg. **13**: 238-239 (Nov.-Dec.) 1934.

occurred during the course of anesthesia. These difficulties were the result of stridor, respiratory obstruction or muscular weakness caused by spinal anesthesia reaching a height in the spinal canal sufficient to impair intercostal activity.

The presence of stridor during the administration of an inhalation anesthetic is not an infrequent occurrence, and, while it is not a serious complication unless accompanied by obstruction, it is annoying to the operator as well as to the anesthetist. It is in all probability caused by a partial spasm of the vocal cords, which if sufficient will produce respiratory obstruction.

TABLE 1.—*Results from the Use of Helium for the Relief of Respiratory Difficulties Occurring During the Course of Anesthesia*

	Total No. of Cases	Complete Relief		Partial Relief		No Relief	
		No.	%	No.	%	No.	%
Stridor alone	39	24	61.5	13	33.3	2	5.1
Partial obstruction	66	31	46.9	24	36.4	11	16.7
Total	105	55	52.4	37	35.2	13	12.4

Laryngospasm is thought by some authorities to occur more frequently when cyclopropane is the anesthetic agent than when other agents are used.

The cases listed as stridor include those in which a crowing-like noise, occurring usually on inspiration, was the only respiratory difficulty; there was no appreciable change in the character of the breathing or in the tidal volume to indicate an obstruction to respiration (table 1).

In the second group of cases there was definite obstruction to respiration. This group includes cases in which the obstruction was mechanical; for instance, postoperative hemorrhage into the tissues of the neck causing tracheal compression or postoperative tracheal edema, as well as ordinary laryngospasm. In all of these cases with the exception of thirteen which will be discussed later, helium was not added until the ordinary methods for the relief of obstruction, such as insertion of oral and nasal breathing tubes, forcible extension of the chin and pressure on the breathing bag, had been tried.

It will be observed from the accompanying tables that of the patients who had stridor alone twenty-four, or 61.5 per cent, obtained complete relief, thirteen, or 33.3 per cent, partial relief and two, or 5.1 per cent, no relief. Of the patients who had both stridor and obstruction, thirty-one, or 46.9 per cent, obtained complete relief, twenty-four, or 36.4 per cent, partial relief and eleven, or 16.7 per cent, no relief.

Thirteen of the cases in which obstruction and stridor were present require further consideration. Obstruction occurred in these cases after thyroidectomy had been performed. It was caused by hemorrhage with tracheal compression or, more frequently, by tracheal edema. In all, obstruction and stridor were present before administration of the anesthetic was begun. These complications usually occur from twenty-four to forty-eight hours postoperatively, at a time when infiltration of the tissues with a local anesthetic is not very satisfactory. In addition, the obstruction is frequently so severe that the patient is cyanotic when brought to the operating room, and it may become complete after the first or second breath of an inhalation anesthetic. Helium was administered to such patients only during the induction period, prior to the insertion of an intratracheal tube. Seven, or 53.9 per cent, obtained complete relief and four, or 30.7 per cent, partial relief, while two, or 15.4 per cent, apparently received no benefit (table 2).

A mixture of helium and oxygen was used in five cases in which partial respiratory paralysis occurred during spinal anesthesia. The paralysis was evidenced by the absence of intercostal activity and the use of the accessory muscles of respiration, and, in addition, the patient said that breathing was difficult. In all of these cases breathing was apparently much easier when the helium and oxygen mixture was administered than when either air or pure oxygen was given. In one case the contents of the breathing bag were changed several times, a mixture of helium and oxygen being alternated with pure oxygen, and in every instance the patient, a physician, said that breathing was much easier when the helium and oxygen mixture was used.

TECHNIC

Before beginning the use of helium it would be well to examine the gas machine carefully for all possible leaks, since this gas is much more difficult to keep in a closed system than are the ordinary gases.

Helium is marketed in cylinders similar to those used for oxygen and the anesthetic gases, and the cylinder may be attached to an ordinary gas machine. For machines which do not have gages calibrated for its use, helium may be delivered through a gage calibrated for some other gas. At the Lahey Clinic the tank containing helium is usually attached to the nitrous oxide yoke. The reading on the nitrous oxide gage is multiplied by the factor 3.3 to determine the amount of helium delivered. This factor will give accurate readings only when the flow is 1 liter or more. With flows of less than 1 liter of helium the rate is probably little if any greater than that of nitrous oxide.

From an economic standpoint the closed carbon dioxide absorption technic is the only one adapted to the use of helium.

Since helium is inert and serves as a diluting agent displacing other gases, cyclopropane is the only anesthetic gas now available which is potent enough to permit the use of large enough quantities of oxygen to allow for any diluting with helium without danger of producing anoxemia. It can, of course, be used with ether anesthesia if the ether is vaporized with oxygen in an entirely closed system.

TABLE 2.—*Results from the Use of Helium for Postoperative Tracheal Obstruction Before Tracheotomy*

Total No. of Cases	Complete Relief		Partial Relief		No Relief	
	No.	%	No.	%	No.	%
13	7	53.9	4	30.7	2	15.4

My associates and I employ two methods of administration, depending on whether the obstruction is present before anesthesia begins or develops during the course of anesthesia.

Technic When Obstruction Is Present Before Anesthesia Is Established.—A flow of approximately 3 liters of helium and 1 liter of oxygen is started and the mask is immediately placed on the patient's face. The patient is allowed to breathe this mixture for from five to ten minutes or until the obstruction is relieved. The bag is emptied each time it becomes distended. The flow of helium is then discontinued, the flow of oxygen is decreased to the estimated requirement of the patient

and cyclopropane is added, usually at the rate of from 300 to 500 cc. per minute, until the patient is anesthetized. If it is necessary to add more helium, the same method is employed as that to be described for the administration of helium to patients in whom an obstruction has developed after they are anesthetized.

Technic When Obstruction Develops After Anesthesia Is Established.—The bag is completely emptied, and a flow of 1,200 cc. of helium, 500 cc. of oxygen and 300 cc. of cyclopropane is started. This combination is estimated to produce a mixture containing 60 per cent helium, 25 per cent oxygen and 15 per cent cyclopropane. These amounts may, of course, be varied as indicated. A careful watch should be maintained at all times to avoid the slightest degree of anoxemia. It is usually necessary to continue this rate of flow for from five to ten minutes, emptying the bag each time it becomes distended, to wash out the excess oxygen and the residual nitrogen in the lungs and to be sure that the patient is actually respiring the mixture delivered. At the end of this time, the administration of the helium and the cyclopropane may be discontinued and the flow of oxygen continued at the rate of from 200 to 400 cc. a minute. Helium and cyclopropane are now added, at a rate just sufficient to compensate for any leaks that may be present in the system. In cases of severe obstruction, moderate pressure on the breathing bag (from 3 to 10 mm. of mercury) is an additional help in the relief of the respiratory obstruction.

The cost of helium, while considerably less than when it was first used, is still an item to be considered. The market price in E sized cylinders is 4 cents a gallon. When from 5 to 10 gallons is used in each case, the cost is from 20 to 40 cents.

SUMMARY

Helium was used during either the induction or the maintenance of anesthesia in 110 cases. In most instances it was used for the relief of various types of respiratory obstruction, such as postoperative tracheal edema, compression of the trachea by postoperative hemorrhage and ordinary laryngospasm. In addition, it has been used a few times as an aid to breathing for patients with partial respiratory paralysis caused by spinal anesthesia.

At the Lahey Clinic we believe that the indications for the use of helium are relatively few, as evidenced by the comparatively small number of cases in which we have used it even though it has been attached to our gas machines for more than two years.

Of all patients for whom we have used helium for the relief of stridor or obstruction, 87.6 per cent obtained either complete or partial relief and 12.4 per cent did not obtain relief.

There is certainly no substitute for a clear and unobstructed airway, and the use of helium is not suggested as a substitute for unobstructed breathing. We do, however, think that in certain cases this gas has been of distinct value in helping us out in an emergency until a tube could be inserted within the trachea. It has also been helpful on many occasions by permitting us to continue smoothly and safely the administration of an anesthetic without inserting an intratracheal tube when otherwise one would have been necessary.

Fortunately our experience with helium as an aid to patients with partial respiratory paralysis has been very limited, but in the few cases it has been a distinct aid to respiration.

605 Commonwealth Avenue.

ECONOMY IN MEDICATION

BERNARD FANTUS, M.D.

CHICAGO

In the present intensive study of medical economics, economy in medication must not be overlooked. This is especially important in hospitals. In such large institutions as the Cook County Hospital, the saving resulting from cooperation between prescribing physician and dispensing pharmacist might easily run into such a huge sum that I hesitate to name it. Even in private practice it pays to economize in medication. Some physicians are nothing less than spendthrifts and wasters when it comes to prescribing. The difficulty a doctor finds in collecting bills may sometimes be due to the fact that the patient's family, after paying for expensive medicines, may have nothing left with which to pay the doctor.

Of course by economy in medication is not meant the use of inferior remedies, for the first principle of economy in prescribing is that the most efficient remedy is likely to be the cheapest. The second principle in the economy of medication should be: Among drugs of equal efficiency, choose the least expensive. What this might mean in the case of hypnotics and analgesics is illustrated in tables 1, 2 and 3.

It will be seen that two of the three most efficient hypnotics, namely, chloral hydrate and barbital, are also the cheapest.

ECONOMY IN HYPNOTICS

Research such as that carried out by Grabfield,[1] the results of which are given in table 1, needs to be multiplied a hundred times. If its lessons were to be promptly incorporated in practice it would pay for itself many times over. At present, hardly anybody seems to know—and nobody seems to care—how much it is necessary to pay in dollars and cents to secure a certain therapeutic effect.

The chemical manufacturing industry is geared to mass production of new drugs, high speed "clinical testing" and high pressure salesmanship and distribution. Ever new variations of chemical compounds are thrown on the market until this has become a veritable jungle, almost impenetrable to the rays of the light of reason. Even the Council on Pharmacy and Chemistry does not pass on the cost of drugs. Information is lacking on the important practical question of whether these newer therapeutic agents are worth the price. What is needed is evaluation of the newer as compared with the older remedies and with one another. Surely a part of this evaluation should be the question of price.

What valuable results, aside from considerations of economy, such studies yield is illustrated in table 2, which shows that a dose of 0.15 Gm. of chloral produced sleep in almost 100 per cent of cases, as compared with amytal, of which approximately two doses of 0.05 Gm. were required to produce sleep. Hence the pharmacopeial average dose of 0.5 Gm. for chloral is over three times as large as it need be, as compared with the hypnotic power of the average efficient (0.1 Gm.) dose of amytal. No wonder that chloral, when it is given in such unnecessarily large doses as 1 or 2 Gm., occasionally produces untoward effects. Grabfield's work also reveals the fact, astonishing to the pharmacologist, that sabromin in double the quantity is as efficient a hypnotic as chloral. This shows, if corrobo-

1. Grabfield, G. P.: Observations on Efficiency of Commonly Used Hypnotics, J. A. M. A. **96**:1865 (May 30) 1931.

rated by others, that its mode of action must be different from that of the bromides, with which it has usually been classed.

In table 2 is shown merely how much it costs to induce sleep, not the relative anesthetic value, in respect to which no doubt amytal and pentobarbital sodium might secure quite a different rating. It is not even contended that more expensive agents might not be worth the difference in price. Paraldehyde, for instance, should probably be the hypnotic of choice for "poor risk" patients, even though it costs three times as much as chloral; but it seems self evident that in a charity hospital one has no right to spend from five to forty times the money for a dose of sleep-producing medicine unless it can be clearly shown that the effect is definitely better than that of chloral.

Table 2 illustrates the difference between the "efficiency price" index of table 1 and the "dose-price" index of tables 2 and 3, the only measure at present applicable in the evaluation of the analgesics. It is evident, when one compares tables 1 and 2, that a 0.5 Gm. dose of chloral is a much more potent hypnotic than a 0.3 Gm. dose of carbromal or a 0.5 Gm. dose of sabromin. The "efficiency-price" index is therefore a much better criterion than the "dose-price" index; but the latter is the best now available to show the relative values of the analgesics. Attention might be called to the last column in tables 2 and 3: the usage "frequency per 10,000 ℞," which is taken from Prof. E. N. Gathercoal's monumental "Prescription Ingredient Survey."[2] The predominant use of phenobarbital as compared with chloral is probably due in part to its greater analgesic value, to its greater ease of administration and to the propaganda promoting its use.

ECONOMY IN ANALGESICS

A glance at table 3 will reveal that acetanilid is the cheapest of all analgesics but that it has a relatively small usage (23 per 10,000 ℞), while codeine, which

TABLE 1.—*"Efficiency-Price" Index of Hypnotics**

Chemical Group	Drug	Dose Used, Gm.	Index of Efficiency†	Efficiency-Price Index: Chloral Hydrate = 1
Alkaloid	Codeine	0.015	0.86	12
Chloroform	Chloral hydrate	0.150	0.97	1
	Butyl chloral hydrate	0.150	0.70	7
	Chlorobutanol	0.150	0.83	5
Barbituric acid	Barbital	0.150	0.94	4.8
	Amytal	0.050	0.53	11.6
	Phenobarbital	0.050	0.69	6.7
	Phanodorn	0.100	0.90	25
	Ipral	0.000	0.71	13
	Neonal	0.050	0.86	10
Bromide	Carbromal	0.300	0.70	33
	Bromural	0.300	0.73	33
	Sabromin	0.360	0.95	18

* Modified from Grabfield's[1] table.

† "Index of efficiency" was secured by prescribing half the amount of the recommended doses and noting the number of doses that were required to produce a comfortable night's sleep. In this way the number of patients observed divided by the number of doses required would give such an index.

is one of the most expensive of analgesics, is employed more than any other of these agents (1,019 per 10,000 ℞). Acetanilid labors under the indictment that it causes methemoglobinemia and collapse. This is possibly true when it is used, as it formerly was, in the full antipyretic dose of 0.5 Gm., and when repeated every hour for two or three doses until a great fall in temperature is secured. Acetophenetidin is used much more extensively because it is "safer"; but it is also less efficient. It requires at least twice the dose to produce the same effect. Probably the real relation of these two drugs to each other is that they are both merely administration forms of paramidophenol and that acetophenetidin is the safer because it yields the active principle more slowly. It is very probable that acetanilid is still used in excessive dosage and that it is a relatively safe drug, provided it is used in doses as small as

TABLE 2.—*"Dose-Price" Index of Hypnotics*

Name	Average Dose, Gm. or Cc.	Dose-Price Index	Frequency per 10,000 ℞
Chloral hydrate	0.5	Unit	44.3
Scopolamine hydrobromide	0.0006	½	1.3
Paraldehyde	2.0	3	2.4
Barbital	0.5	5	37.4
Phenobarbital	0.10	8	288.1
Sulfonethylmethane	0.75	9	8.2
Ethyl carbamate (urethane)	2.0	10	
Sabromin	0.5	13	0.16
Pentobarbital sodium	0.1	15	
Carbromal (adalin)	0.3	16	5.9
Amytal	0.1	17	32.5
Amytal sodium	0.2	40	

0.1 Gm., which might be repeated every hour for two or three doses if required. It should be remembered in this connection that the coal tar analgesics are really merely antineuralgics, that they are not suitable for the relief of traumatic pain and that, if a moderate dose fails to relieve the pain, a larger dose is also likely to fail and may cause phenomena of intoxication. A relative efficiency test of acetanilid and acetophenetidin is decidedly in order. It might show that the "price-efficiency" index is even more favorable to acetanilid than 7 to 1, the "dose-price" index of table 3.

Of the pyrazolon derivatives, aminopyrine was used much more extensively (230 times in 10,000 ℞) than antipyrine (nine times). This is, no doubt, due to the fact that antipyrine is much more prone to produce untoward irritative phenomena: gastro-intestinal, respiratory, dermal. It is an interesting question which a "price-efficiency" study might settle, whether aminopyrine is really worth twenty-four times as much as acetanilid. If the latter is found as efficient in 0.1 Gm. doses, its price advantage would be doubled and its toxic tendency lessened.

The older drugs labor under the disadvantage that they are known so well as to have all their faults known. The new and untried drugs come heralded as free from faults until, by tragic experience, some one discovers that their spotless reputation was due merely to lack of acquaintance with them. Witness the vicious tendency of cinchophen to produce hepatic atrophy or that of aminopyrine with or without barbiturate to cause neutropenia in certain cases. Entirely aside from this possibility, allonal (allylisopropyl barbituric acid with aminopyrine), with a "dose-price" index of 145, is certainly an uneconomical proprietary medicine; it should be tabu at least in charity hospitals.

The enormous use of codeine is due, of course, to its employment other than as analgesic. It is probably more extensively used as an antitussic ("cough-killer"). Entirely aside from the question of whether its use as an antitussic should not be greatly lessened, it might be stated without hesitancy that its use as an analgesic might be greatly restricted in hospitals, at least, in favor of morphine. In private practice, codeine has the advantage of being much less habit forming. This matter plays but a subordinate role in hospitals in which the supply of the drug is completely under control. Codeine is a relatively poor pain killer. Its analgesic efficiency

2. Gathercoal, E. N.: Prescription Ingredient Survey, Washington, D. C., American Pharmaceutical Association, 1933.

as compared with that of morphine is certainly much less than that suggested by the relation of their average doses (approximately 1:4). It is more nearly 1:8, and it is probably less than that. This would make morphine, which is still the "king of pain killers," at least eight times more economical than codeine. In the presence of severe (traumatic or inflammatory) pain, its use is much more humane. Why should a patient be allowed to suffer the excruciating pain of pleurisy—each breath like the stab of a knife in the side—when a hypodermic injection of morphine would promptly assuage it, whereas hardly any dose of codeine will.

As remedies for "rheumatic" pains, the comparison between acetylsalicylic acid and neocinchophen might be in order. Even admitting that neocinchophen is a remarkably safe drug and much less liable to produce hepatic degeneration than cinchophen, is it worth twenty-four times as much as acetylsalicylic acid?

If the desired degree of remedial action can be increased by combination of drugs that produce a certain therapeutic effect by acting on different portions of a functional system (Bürgi's rule), then combining the least expensive of each of the groups already discussed—namely, acetanilid, acetylsalicylic acid and morphine sulfate—in half the average official dose ought to produce a combination analgesic at once safe, potent and inexpensive. With this one might possibly give scopokamine hydrobromide to add its analgesic influence and to antagonize the diaphoretic tendency of the other agents.

ECONOMY IN DISINFECTANTS

Such studies as have been suggested for hypnotics and analgesics should be developed in all other directions. One more example will have to suffice here. The phenomenal commercial success of mercurochrome, which advertises itself by its color, has led enterprising manufacturers to push, by high pressure sales methods, other new disinfectants. Let it be understood that I am not finding fault with the remedies, the enterprise that produced them or the methods employed in their

TABLE 3.—*"Dose-Price" Index of Analgesics*

Name	Dose, Gm.	Dose-Price Index	Frequency per 10,000 Rx
		Unit	
Acetanilid	0.20	23.3	
Scopolamine hydrobromide	0.0006	3	1.3
Acetylsalicylic acid	0.30	4	453.8
Acetophenetidin	0.30	7	582.0
Antipyrine	0.30	12	9.1
Morphine	0.008	15	208.5
Aminopyrine	0.30	24	230.3
Opium	0.06	40	62.8
Phenobarbital	0.03	45	298.1
Codeine	0.03	65	1018.9
Neocinchophen	0.50	97	8.8
Allonal (allyl-isopropyl barbituric acid with aminopyrine)	0.15	145	72.0

distribution. But somewhere, somehow, somebody needs to present all the facts in as impartial a manner as possible. In table 4 are the prices of probably equivalent skin disinfectants. The use of tax-free alcohol is figured on, as the alcohol used for the making of disinfectants should be purchased appropriately denatured.

It will be seen (table 4) that mercury bichloride (1:1,000) is the cheapest of all disinfectants. It is odorless, does not spoil rubber gloves and for these reasons might be considered the most economical operating room hand disinfectant. A colored Harrington's solution, such as the tincture of mercury bichloride (q. v.), yields a skin disinfectant that shows by its color where it has been applied, at a vastly lower price than the colored proprietary disinfectants.

Saponated solution of cresol in 2 per cent dilution is another reliable disinfectant, cheap enough to be used as a solution for the hands. Its soapy slipperiness makes it the preferred disinfectant in obstetric and gynecologic examinations, and, because of its relative kindness to the skin, it is the favorite skin disinfectant in some hospitals for contagious diseases.

Trinitrophenol (picric acid), though powerful and relatively inexpensive, is perhaps somewhat too prone to cause an obstinate dermatitis in certain predisposed individuals to be recommended for general use.

TABLE 4.—*Relation of Prices of Skin Disinfectants*

Name	Price Index
	Unit
Mercury bichloride 1:1,000	1
Compound cresol solution, 2 per cent dilution	4
Picric acid, 5 per cent in 50 per cent alcohol	74
Mild tincture of iodine (U. S. P.)	135
Tincture of iodine diluted to half strength	238
Mercurochrome, 2 per cent acetone in alcohol	500
Solution of merthiolate	960
Tincture of merthiolate	1,000
Tincture of metaphen	2,125

Iodine is the favorite skin disinfectant for the operative field. Tincture of iodine is too irritative for this purpose. Indeed, it was never designed for skin disinfection but intended as a rubefacient, for the production of counterirritation. Mild tincture of iodine (2 per cent) should be used in its stead for skin disinfection. Research [3] has shown that silk, a material which approaches the skin in chemical nature, absorbs much more iodine from aqueous iodine-iodide solutions than from alcohol or glycerin solutions of equal iodine strength. This is evidently because water, being the poorer solvent for iodine, gives it up to the tissue more readily than when the iodine is presented in a better solvent such as glycerin or alcohol. Karns, Cretcher and Beal [4] show that the amount of iodine deposited from a 3 per cent aqueous iodine-potassium iodide solution adhering to silk is ten times as great as from a solution of like strength in 70 per cent alcohol. If two fingers, immersed in the two solutions for from fifteen to thirty seconds, are washed with water, a considerable dose of iodine remains on the finger withdrawn from the aqueous solution, while the finger from the alcoholic solution is practically free from iodine. In clinical trials a solution of 2 per cent iodine strength has been found most satisfactory for the operating field.[5] It is applied in excess, allowed to remain in place for from fifteen to thirty seconds, and then removed with absorbent gauze or cotton. The solution in diluted alcohol of 2 per cent each of iodine and potassium iodide is now the official Mild Tincture of Iodine. For disinfection of the genitalia, iodine is generally considered too irritative. A mercury bichloride solution is to be preferred. Spray application of the disinfectant should be considered as much more economical than application by gauze "sponges," which retain most of the disinfectant in their meshes. Rosenblatt [6] recommends it especially in gynecologic cases not only because of economy but also because of its more thorough distribution even to the interior of the cervix. James Raglan Miller [7] recommends the spray as the most economical and efficient

3. Karns, G. M.: The Behavior of Iodine Solutions at Liquid-Solid Interfaces, J. A. Pharm. A. **21**: 779-782 (Aug.) 1932.
4. Karns, G. M.; Cretcher, L. H., and Beal, G. N.: The Behavior of Iodine Solutions at Liquid-Solid Interfaces: II. J. A. Pharm. A. **21**: 783-787 (Aug.) 1932.
5. LaWall, C. H., and Tice, L. F.: A Pharmaceutical Study of Iodine Solutions for Antisepsis, J. A. Pharm. A. **21**: 122-125 (Feb.) 1932.
6. Rosenblatt, Jakob: Eine Vereinfachung der grossich'schen Methode der Hautjodierung, Zentralbl. f. Gynäk. **52**: 2848 (Nov. 5) 1928.
7. Miller, J. R.: A Convenient Method for Cleansing the Meatus Prior to Catheterization, J. A. M. A. **90**: 292 (Jan. 28) 1928.

method for the application of any disinfectant solution in preparing the field of operation, whether it is laparotomy, delivery or any other surgical procedure.

ECONOMY IN ANESTHESIA

The Golds [8] have shown that hospitals pay about six times as much for ether bought in one fourth pound cans as compared with the price of U. S. P. ether in 27 pound drums. They have also shown that deterioration is by no means as rapid as surgeons have been led to believe. Hospital pharmacists might daily fill the small cans used in the operating rooms from drums of ether without any danger whatever (provided suitable precautions requisite for the handling of explosive liquids are taken) at a saving that might amount in almost any one of the large hospitals to several thousand dollars a year.

A great saving can also be effected by adopting the "closed circuit" system of administration of gas-oxygen or ethylene anesthesia as devised by Waters.[9] This consists in abolishing the exhalation valve and introducing a canister of soda lime between the mask and the breathing bag. This absorbs the carbon dioxide and permits the use of the anesthetic gas over and over again. Not only does it reduce greatly the cost of gas anesthesia but it is also claimed that the conservation of heat and moisture are of great value.

ECONOMY IN THE DRUG ROOM

While hospital pharmacists, no doubt, buy as economically as they can, it is not generally appreciated that many preparations which the hospital pharmacist purchases from the manufacturer could be prepared by him at a saving of at least 50 per cent at an average, and this includes in the calculation the expense of the pharmacist's time. In some cases as, for instance, in connection with "ephedrine inhalant," the saving may be somewhat in the proportion of 16 to 1.

The modern hospital pharmacist ought to be able and willing to prepare multiple dose ampules; i. e., sterile injection solutions put up in so-called vaccine vials. The National Formulary contains detailed directions for the preparation of these, and it is hoped that hospital pharmacists will avail themselves of them, for the high price of individual ampules is largely due to the enormous breakage that occurs in their manufacture and handling. The saving might easily amount to 90 per cent. A smaller but still considerable percentage of saving could be secured if pharmacists, instead of buying hypodermic tablets, would put up equivalent solutions ready for injection in multiple dose vaccine vials. At the same time hypodermic administration would be made so much more convenient to the nurse, and when fractions of standard doses are prescribed, the remainder of the dose need not be wasted.

The amount of money that the pharmacist can save by his own exertion is small as compared with the money that can be saved by medicopharmaceutic cooperation. For instance, the preparation of capsules and of powders in divided doses is quite expensive in pharmaceutic labor as compared with the dispensing of tablets and that of powders in bulk. Whenever, therefore, careful measuring of the dose is not required, bulk powders should be prescribed. The patient can often adjust the dose of antacid powder or of cathartic saline required by him—which may vary from time to time—more successfully than the physician can estimate it. Tablets should be prescribed whenever possible, provided they are so manufactured as to disintegrate readily. In large hospitals, a distinct saving of money can be achieved by the installation of a tablet machine, permitting the pharmacist to manufacture the tablets used in the hospital.

The matter of the economy of prescribing official rather than proprietary preparations has been so well and so thoroughly discussed during the last decade that space need not be taken here for this purpose. Table 5 may serve to show the economy of prescribing some of these chemicals by their nonproprietary name.

ECONOMY IN PLACEBOS

Finally, it should be pointed out that a great saving can also be secured by rational prescribing of placebos. It might be tactless to estimate the amount of medicine that is prescribed merely for its psychic effect on the patient. The modern tendency is, no doubt, away from the placebo. It is not only more economical, as well as more honest, but also often more efficient in the long run to employ skilled pure psychotherapy than medicine as the vehicle of indirect suggestion. It may, however, be impossible to get along entirely without placebos,

TABLE 5.—*Comparison of Prices of Identical Chemicals Under Different Names*

Proprietary	Price, 1 Oz.	Chemical	Price, 1 Oz.
Phenacetin	$0.63	Acetophenetidin	$0.21
Pyramidon	0.82	Aminopyrine	0.47
Aspirin Bayer	0.75	Acetylsalicylic acid	0.13
Veronal	3.00	Barbital	0.54
Atophan	2.75	Cinchophen	0.38
Urotropin	0.25	Methenamine	0.16
Tolysin	2.00	Neocinchophen	1.01
Luminal (in ½ oz. carton)	6.90	Phenobarbital	0.61
Aristol	1.80	Thymol iodide	0.43

and the lower the degree of the patient's intelligence the more he may be benefited by a placebo rather than by a preachment. He may indeed need both.

While it is poor policy to prescribe colored water or bread pills or anything else that is known to be absolutely inert, it is even worse to force the patient to spend a lot of money on intrinsically worthless but high priced medicines. Many millions of patients' money are annually wasted by the modern habit of prescribing of "vitamins" when none are needed, for they are altogther adequate in the ordinary everyday diet. Indeed, prescribing expensive vitamins, when there really is a need for them, without simultaneously teaching the patient how to get along without the medicine by improving his diet, is failing in the duty of the physician. The fancy "tonics" that taste like "tipples" and act as such are still, in spite of the repeal of the eighteenth amendment, a large cause of useless expenditure of patients' money.

Who could calculate the millions of dollars that might be saved annually by "debunking" some of the polypharmaceutic mixtures. These medicines, containing in their formulas numerous entirely superfluous and inactive ingredients, are generally the heritage of the ages; formulas conscientiously carried along by pharmacists who would not dare to delete any one of the ingredients because they believe the physician wants them, when in most instances the physician does not even know that these ingredients are there and neither he nor the patient would know it if they were not there. The thankless job of cleansing this Augean stable is hardly worth while undertaking, for these preparations will probably die their natural death in the near future. In

8. Gold, Harry, and Gold, David: Stability of U. S. P. Ether After the Metal Container Is Opened, J. A. M. A. **102**: 817 (March 17) 1934.
9. Waters, R. M.: Carbon Dioxide Absorption from Anesthetic Mixtures, California & West. Med. **35**: 342 (Nov.) 1931.

the meantime, it is best in the interest of economy to prefer simple to complex remedies.

If one wishes to prescribe a placebo, one might remember that iron and calcium are not very abundant in our daily food. One or the other of these might perchance be deficient and one or the other of them might be prescribed in inexpensive and inoffensive form; for example, as tablets of saccharated ferrous carbonate or of calcium lactate.

MYASTHENIA GRAVIS

CONSIDERATION OF RECENT ADVANCES AND INFLUENCE OF PREGNANCY: REPORT OF CASE

HARRY TABACHNICK, M.D.
MILWAUKEE

The etiologic knowledge of myasthenia gravis is as yet incomplete, and the finger of suspicion is still directed at the endocrines. However, clinical insight relative to symptomatic therapy and diagnosis of this disease has progressed rapidly since 1934.

RECENT ADVANCES PERTAINING TO ETIOLOGY

In 1934 Nevin,[1] concerned with muscle chemistry in myasthenia gravis, concluded that the myoneural junction would be the location of clue to more lucid understanding of the etiology and treatment of the disease. The work of Dale and Feldberg [2] indicated that normal excitation transmission at the myoneural junction depends on the liberation of acetylcholine.

The work of Pitfield [3] and of Simon [4] reported in 1935 and of Kennedy and Wolf [5] in 1937 seemed to incriminate the endocrines for the dysfunction of acetylcholine at the myoneural junction. It was found, for example, that insulin improved myasthenia as did ephedrine and epinephrine, whereas thyroid and thymus exaggerated its symptomatology. Kennedy and Wolf concluded among other things that endocrine disorder, little understood, is at work in this disease.

RECENT ADVANCES IN THE TREATMENT

Within the past three years the treatment of myasthenia gravis has advanced remarkably. Therapy has kept pace with the better understanding of the mechanism of excitation transmission at the myoneural junction. Walker in 1934 [6] first reported a case of myasthenia which by the use of physostigmine was definitely improved. In the following year she [7] demonstrated before the clinical section of the Royal Society of Medicine the improvement that occurred in one case with the use of prostigmine, an analogue of physostigmine. Since this original observation there has been no derogating evidence on the action and efficacy of prostigmine in the treatment of myasthenia gravis. Walker demonstrated that a subcutaneous injection of 2.5 mg. of prostigmine was followed by disappearance of ptosis and ophthalmoplegia within five minutes. Maximum effect was obtained in one hour, and in from six to eight hours there was a gradual return to the weakened state.

Walker advocated intramuscular injection in single doses of from 3 to 5 cc. of a 1:2,000 solution, the equivalent of from 1.5 to 2.5 mg., combined with atropine sulfate, once a day, at intervals of several days. Atropine was given to counteract the sometimes severe intestinal cramps and bradycardia that ensued.

Observations on prostigmine used orally were reported by Everts [8] in 1935 and by Laurent and Walker [9] in 1936. The latter noted that from 25 to 30 mg. gave a result comparable to the subcutaneous injection of 0.5 mg. When it was thus administered improvement occurred within forty minutes, with reaction of maximum intensity at the end of two hours. The maximal reaction persisted for from six to eight hours and gradually subsided. After several months of treatment there was no detectable exaggeration of symptoms.

The influence of prostigmine by injection disappears in about five hours and for this reason Winkelman and Moore [10] in 1937 advocated the giving of smaller doses two or three times a day similar to the manner in which insulin is administered in cases of diabetes. Prostigmine thus given permits chewing, swallowing and some degree of useful activity on the part of the patient.

RECENT ADVANCES IN DIAGNOSIS

Pharmacologic evidence garnered from the work of Stavraky [11] with the drug quinine and that of Sollmann [12] with the drug physostigmine led Kennedy and Wolf to conclude that prostigmine is effective in myasthenia through its catalytic influence on acetylcholine at the myoneural junction, an effect pharmacologically opposed to that of quinine at this location. Quinine therefore is as effective in myotonia as is prostigmine in myasthenia. These two entities are clinical opposites. From the foregoing it is logical to deduce that in diagnosis of myasthenia gravis the giving of quinine would be expected to exaggerate the clinical picture.

There are many instances in which the diagnosis of myasthenia is difficult to establish. Harvey and Whitehill,[13] reporting in April 1937, considered prostigmine of value in the diagnosis of myasthenia. They observed that in nine cases with fairly definite clinical pictures an injection of prostigmine was followed by a promptly striking response. In one doubtful case there was no response. In a group of thirteen other neurologic disorders wherein muscle abnormalities or cranial nerve palsies were present, there was no immediate response to prostigmine.

Attention was again called to the use of prostigmine as a diagnostic test by Gammon and Scheie,[14] who in

From the Neurological Clinic, Mount Sinai Hospital-Dispensary, and Department of Neurology, Marquette University Medical School.

1. Nevin, Samuel: Study of Muscle Chemistry in Myasthenia Gravis, Brain **57**: 239-254 (Oct.) 1934.
2. Dale, H. H., and Feldberg, W.: The Chemical Transmission of Secretory Impulses to the Sweat Glands of the Cat, J. Physiol. **82**: 121-128 (Aug. 24) 1934.
3. Pitfield, R. L.: Use of Insulin in Myasthenia, Tuberculosis and Other Disorders of Nutrition, M. Rec. **141**: 328-331 (April 3) 1935.
4. Simon, H. E.: Myasthenia Gravis: Effect of Treatment with Anterior Pituitary Extract; Preliminary Report, J. A. M. A. **104**: 2065-2066 (June 8) 1935.
5. Kennedy, Foster, and Wolf, Alexander: Experiments with Quinine and Prostigmine in Treatment of Myotonia and Myasthesia, Arch. Neurol. & Psychiat. **37**: 68-74 (Jan.) 1937.
6. Walker, Mary B.: Treatment of Myasthenia Gravis with Physostigmine, Lancet **1**: 1200-1201 (June 2) 1934.
7. Walker, Mary B.: Case Showing the Effect of Prostigmine on Myasthenia Gravis, Proc. Roy. Soc. Med. **28**: 759 (April) 1935.
8. Everts, W. H.: The Treatment of Myasthenia Gravis by the Oral Administration of Prostigmine, Bull. Neurol. Inst. New York **4**: 523-530 (Dec.) 1935.
9. Laurent, L. P. E., and Walker, Mary D.: Oral and Parenteral Administration of Prostigmine and Its Analogues in Myasthenia Gravis, Lancet **1**: 1457-1459 (June 27) 1936.
10. Winkelman, N. W., and Moore, M. T.: Prostigmine in the Treatment of Myasthenia Gravis and Muscular Dystrophy, Arch. Neurol. & Psychiat. **37**: 237-250 (Feb.) 1937.
11. Stavraky, G. W.: Effect of Quinine on Parasympathetic and Sympathetic Innervation of the Salivary Glands, J. Pharmacol. & Exper. Therap. **47**: 321-338 (March) 1933.
12. Sollmann, Torald: A Manual of Pharmacology, ed. 5, Philadelphia, W. B. Saunders Company, 1936, p. 382.
13. Harvey, A. M., and Whitehill, M. R.: Prostigmine as an Aid in the Diagnosis of Myasthenia Gravis, J. A. M. A. **108**: 1329-1333 (April 17) 1937.
14. Gammon, G. D., and Scheie, Harold: Use of Prostigmine as a Diagnostic Test of Myasthenia Gravis, J. A. M. A. **109**: 413-414 (Aug. 7) 1937.

August 1937 reported a study including cases of myotonic dystrophy, family periodic paralysis, amyotonia congenita and myasthenia gravis and normal individuals. They observed that prostigmine, in doses ordinarily employed in treating myasthenia gravis, sets up marked fibrillary tremors in the muscles of normal persons and in all cases of muscular disease except myasthenia. The twitchings, though generalized, were most observable in the eyelids and tongue. It was evident also that prostigmine exaggerated the weaknesses in all cases except the myasthenic. From their studies Gammon and Scheie concluded that prostigmine appears to be specific for myasthenic weakness and that it may possibly find its greatest usefulness in the differentiation of myasthenia from other entities with muscular weakness.

INFLUENCE OF PREGNANCY

Interest in the undetermined etiologic role of the endocrines is further enhanced by the consideration of myasthenia gravis associated with pregnancy. In 1906 Sir Farquhar Buzzard [15] observed symptomatic fluctuations in myasthenia during pregnancy. In 1907 Tilney [16] observed myasthenia gravis begin during pregnancy. In 1924 Grosse [17] reported a case in which symptoms first developed during pregnancy and recovery took place after induction of premature labor. In Cecil's textbook [18] there is the statement that symptoms of the disease often disappear during pregnancy. Stevens [19] mentions the puerperal state as an etiologic factor in the disease. Laurent [20] in 1931 reported the case of a woman with myasthenia who was observed through seven pregnancies, in two of which she manifested remissions; in five subsequent ones she suffered relapses. Wechsler [21] states that myasthenia more often affects females than males.

REPORT OF CASE

Mrs. Z. B., white, aged 37, weighing 138 pounds (62.6 Kg.), the mother of four children, first seen May 20, 1936, in the neurologic clinic of the Mount Sinai Dispensary, stated that since childbirth one year before she had been conscious of an easy tendency to fatigue and marked generalized weakness. Her remote past history was irrelevant as was her family history. The neurologic examination revealed no organic defect. Studies of the blood, urine and basal metabolic rate, previously done in the clinic, were negative. A working diagnosis of neurocirculatory asthenia or neurasthenia was made and she was placed on ephedrine sulfate three-eighths grain (0.02 Gm.) three times a day. At the next visit, a month later, she reported marked increase in strength and vigor. On each of the following monthly visits the same report on improvement was obtained and in September 1936 the dose of ephedrine was reduced to three-eighths grain once daily because of complaint of sleeplessness. In November 1936 a small dose of phenobarbital to be taken at bedtime was prescribed, and she was directed to take the one dose of ephedrine early in the day. At this visit she offered the additional information that she had been induced by her friends to visit a well known North American clinic, where she was told that she was nervous.

She was not seen again in the clinic until Sept. 8, 1937, at which time, by interim history taking, it was ascertained that in the previous July she had been hospitalized for several days after having suffered a fall. The hospital record of this stay revealed no mention of physical defect save a minor head contusion. However, she was suspected of having some form of myopathy, for which she was given aminoacetic acid while in the hospital. There were apparently no suggestions of myasthenic facies at that time. On this visit to the clinic, when questioned regarding the fall, she explained that it had occurred after climbing a few stairs, when she became dizzy and her knees seemingly gave way. Further interim history revealed that for three months she had been experiencing greater fatigue and weakness than ever before, plus difficulty with chewing and swallowing food. She stated that she very frequently choked over food and therefore had to limit her food to small quantities of liquids. On neurologic examination it was found that the voice was weak and of peculiar nasal tone. The speech seemed labored and thick. She presented the typical myasthenic facies with bilateral ptosis and appearance of facial diplegia. Ophthalmoplegic signs consisted of inability to direct the eyes upward above a horizontal plane and limitation in movement of the eyes on looking to the sides. To complete the scope of vision she compensated by tilting the head upward or rotating it sideways. There was generalized weakness but no paralysis, atrophy or sensory defect. A diagnosis of myasthenia gravis was made and she was hospitalized at Mount Sinai Hospital for a study with prostigmine.

In the hospital she gave a history of amenorrhea of four months' duration and the gynecologist on service noted that the uterus was increased to the size of a four months pregnancy. The Aschheim-Zondek test was positive. Studies of the basal metabolic rate and the blood inclusive of blood chemistry were negative save for moderate secondary anemia, which was attributed to past inability to eat and to pregnancy.

Before the evening meal on her second day in the hospital, the first dose of prostigmine methyl sulfate [22] consisting of 2 cc. of a 1:2,000 solution was administered. Within ten minutes a spectacular change in her appearance was observed. The ptosis disappeared. There was a return of expressive personality in the facial appearance. She was able to gaze at the ceiling of the room without tilting the head upward. She was able to rise to the sitting position in bed without the necessity for support of the head. She partook of solid food with enthusiasm, exclaiming with an increasingly strong tone of voice that it was her first enjoyable meal in months. She thereafter talked almost incessantly for two hours and was seemingly overjoyed at the sudden return of her former vigor. The influence of this injection of prostigmine methyl sulfate was dissipated in five hours. At the time of writing of this report (Oct. 15, 1937) she was receiving 2 cc. of prostigmine methyl sulfate fifteen minutes before each meal.[23]

SUMMARY AND CONCLUSIONS

In a case of myasthenia gravis, myasthenic weakness had its onset after childbirth, and the myasthenic facies with exaggeration of symptoms was observed to set in during the early course of the next pregnancy.

Myasthenic weakness may precede the myasthenic facies.

Prostigmine is a valuable drug in both treatment and diagnosis of myasthenia gravis. It is suggested that prostigmine may be of aid in the diagnosis previous to the onset of the myasthenic facies; that is, when the malady is in what may be termed a stage of incipience.

There is need for more determinate information on myasthenia gravis with pregnancy. An accumulation of data including use of the newer quantitative endocrine determinations is likely to assist in clarifying the possible relationship of the endocrines to the disease.

606 West Wisconsin Avenue.

15. Buzzard, Farquhar, cited by Kennedy and Wolf.[5]
16. Tilney, Frederick: Neurographs **1**: 20-46, 1907.
17. Grosse, A.: Bull. Soc. d'obst. et de gynec. **13**: 106, 1924.
18. Cecil, R. L.: A Text-Book of Medicine, ed. 3, Philadelphia, W. B. Saunders Company, 1935, p. 1396.
19. Stevens, A. A.: Practice of Medicine, ed. 2, Philadelphia, W. B. Saunders Company, 1928, p. 953.
20. Laurent, L. P. E.: Remissions and Relapses Associated with Pregnancy in Myasthenia Gravis, Lancet **1**: 753-754 (April 4) 1931.
21. Wechsler, I. S.: A Text-Book of Clinical Neurology, ed. 2, Philadelphia, W. B. Saunders Company, 1931, p. 201.

22. Dimethylcarbamic ester of m-oxyphenyl trimethylammonium methyl sulfate.

23. Since this paper was submitted for publication, administration of prostigmine was changed from the subcutaneous to the oral route with somewhat better result. Since Nov. 15, 1937, this patient has been receiving two tablets, 30 mg., of prostigmine bromide (dimethylcarbamic ester of m-oxyphenyl trimethylammonium bromide) about thirty minutes before meals. Prostigmine tablets for use in this case were the donation of Hoffmann-LaRoche, Inc., Nutley, N. J.

SODIUM THIOSULFATE AND THE ELIMINATION OF ARSENIC

SAMUEL AYRES JR., M.D.
AND
NELSON PAUL ANDERSON, M.D.
LOS ANGELES

The administration of sodium thiosulfate for the treatment of arsenical dermatitis has been an accepted procedure among dermatologists ever since it was first introduced by Ravaut,[1] in 1920. In this country McBride and Dennie [2] confirmed the value of the treatment, and since then numerous clinicians have attested its value in shortening the duration and lessening the severity of arsenical eruptions, especially postarsphenamine dermatitis. A number of investigators [3] have shown that the administration of sodium thiosulfate orally or intravenously causes a prompt and pronounced increase in the elimination of arsenic, followed in the course of several weeks by a gradual diminution in the output of urinary arsenic, to the point where only traces or none at all can be detected, although it must be admitted that carefully compiled statistical studies have not been numerous. Some conflicting reports, however, have appeared, notably those of Young [4] and of Mattice and Weisman.[5] Moore [6] in his textbook on the treatment of syphilis, made the rather dogmatic statement that he had seen no evidence that the drug is of any value whatever.

Sulzberger and Goodman,[7] in their annual review of allergy in dermatology in a recent issue of the *Journal of Allergy*, apparently accepted the conclusions of Mattice and Weisman as the last word on the subject when they stated:

> It seems that still another fallacy regarding arsenic excretion has been uncovered by Mattice and Weisman, who . . . demonstrated that . . . far from increasing arsenic excretion, the administration of sodium thiosulphate actually decreased the urinary output of the metal. Inasmuch as no satisfactory clinical proof of the efficacy of sodium thiosulphate in the therapy of arsenical dermatoses has been adduced, it would seem that, in the light of these new experimental findings, the drug may actually do harm rather than good.

Such diametrically opposed points of view seem to call for a reappraisal of the entire subject. A matter of this sort is susceptible of quantitive investigation. It would appear unfortunate therefore that Sulzberger and Goodman should accept the conclusions of Mattice and Weisman as definitive in the face of a considerable volume of clinical and experimental evidence to the contrary, especially since Mattice and Weisman drew their conclusions from observation of only four patients, of whom none were suffering from arsenical dermatitis and one was not even suspected of having an arsenical disorder.

We have for a number of years been interested in the subject of arsenic as an etiologic factor in certain disorders of the skin and have made a practice of regularly testing the urine for arsenic before and immediately after the injection of sodium thiosulfate in all cases of suspected arsenical causation with the exception of cases of frank postarsphenamine dermatitis, of which we have fortunately seen but few during recent years. We admit the validity of the conclusions of Mattice and Weisman [8] to the effect that the excretion of arsenic even by clinically normal persons is subject to considerable variation from day to day, and we also admit that the mere finding of a small amount of arsenic in the urine does not prove that the clinical disorder in question is due to arsenic.

Influence of Sodium Thiosulfate on the Urinary Excretion of Arsenic *

Diagnosis	Case	Arsenic Before Sodium Thiosulfate†	Arsenic After Sodium Thiosulfate†	Subsequent Tests
Arsenical keratoses of palms and soles associated with multiple benign superficial epithelomas	1	0.0039	0.0897	
	2	Negative	0.0013	
	3	0.0369	Trace	
	4	0.0289	0.0380	
	5	Trace	0.0310	
	6	0.0077	0.0730	
	7	0.0312	0.2710	
	8	0.0230	0.7160	After 40 days, 0.0310; after 1 year, 0.0240
	9	Negative	0.0079	
Scleroderma (morphea)	10	Negative	Negative	
Dermatomyositis	11	0.0038	0.0320	After 18 days, 0.0770; after 29 days, 0.0059; after 70 days, 0.0048
Vitiligo	12	0.0088	0.0081	
Widespread eczematous eruptions or typical exfoliative dermatitis	13	0.0320	0.9800	After 7 days, 0.0192
	14	0.0192	0.1570	After 39 days, 0.0397; after 7 months, 0.0801
	15	0.0110	0.4120	
	16	Negative	0.1440	After 11 months, negative
	17	0.0423	0.2920	
	18	0.0038	0.0501	After 50 days, negative
	19	0.0092	0.0675	
	20	0.0110	0.0960	
	21	0.0230	0.2300	After 21 days, 0.0179
	22	0.0240	0.2500	After 29 days, 0.046; after 80 days, 0.028; after 7 months, 0.046
	23	Negative	Negative	
	24	Negative	0.1200	After 26 days, 0.0041
	25	Negative	0.0020	
	26	Negative	Negative	
	27	0.0115	0.2310	
	28	0.0038	0.0015	
	29	Negative	0.0144	
Exfoliative dermatitis alternating with dermatitis herpetiformis	30	0.0084	0.0585	After 52 days, 0.077; after 68 days, 0.0173
Eczematous eruptions of undetermined origin and of less extensive distribution	31	0.0034	0.0051	
	32	Negative	0.0101	
	33	Negative	0.0180	
	34	0.0460	0.0210	
	35	0.0089	0.00239	
	36	0.0096	Negative	
	37	0.0192	0.0810	
	38	0.0096	0.0210	
Hyperkeratotic eczema of palms and soles	39	0.0160	0.3300	After 34 days, 0.039
	40	0.0068	0.1620	After 39 days, negative
Dermatitis venenata (proved by patch tests)	41	Negative	Negative	
	42	0.0230	0.1050	After 4 months, 0.0064
	43	Negative	0.0449	
Pruritus (generalized)	44	0.0192	0.3490	Had received iron cacodylate once a week for a year prior to 3 months before first visit
Alopecia areata	45	Negative	0.0920	
	46	0.0102	0.0174	
	47	0.0042	0.1380	After 3½ months, 0.011
	48	0.0096	0.3020	After 2 months, 0.067
	49	0.0090	0.1730	

* The Gutzeit test with control was used in all determinations.
† Urinary arsenic expressed in milligrams of arsenic per hundred grams of solids at the time of the patient's first visit.
‡ Arsenic in the urine collected immediately after the intravenous injection of 1 Gm. of sodium thiosulfate in 10 cc. of sterile distilled water.

1. Ravaut, P.: Internal Treatment of Skin Disease, Presse méd. **28:** 73 (Jan. 28) 1920.
2. McBride, W. L., and Dennie, C. C.: Treatment of Arsenical Dermatitis and Certain Other Metallic Poisonings, Arch. Dermat. & Syph. **7:** 63 (Jan.) 1923.
3. Kuhn, H. A., and Reese, H. H.: Sodium Thiosulphate in the Treatment of Metallic Intoxication, J. A. M. A. **85:** 1804 (Dec. 5) 1925. Groehl, M. R., and Myers, C. N.: Sodium Thiosulphate in the Treatment of Dermatitis and Jaundice as a Result of Metallic Intoxication, Therap. Gaz. **48:** 691 (Oct. 15) 1924.
4. Young, A. G.: Studies of the Action of Sodium Thiosulphate in Metallic Intoxications, J. Lab. & Clin. Med. **13:** 622 (April) 1928.
5. Mattice, M. R., and Weisman, Donald: Urinary Excretion of Arsenic: II. The Influence of Thiosulphate, Am. J. M. Sc. **193:** 420 (March) 1937.
6. Moore, Joseph Earle: The Modern Treatment of Syphilis, Springfield, Ill., Charles C. Thomas, Publisher, 1933, p. 89.
7. Sulzberger, M. B., and Goodman, Joseph: Allergy in Dermatology, a Critical Review of Some Recent Contributions, J. Allergy **8:** 385 (May) 1937.
8. Mattice, M. R., and Weisman, Donald: Urinary Excretion of Arsenic: I. Normal Subjects, Am. J. M. Sc. **193:** 413 (March) 1937.

We are not presenting this paper with the thought of assigning an arsenical causation to the various disorders enumerated in the accompanying table but with the sole object of offering concrete evidence of the definite and constant action of sodium thiosulfate in causing an increased elimination of urinary arsenic. In the cases in which subsequent determinations were made, a definite curve could be plotted showing a gradual increase in the excretion of arsenic during continued administration of sodium thiosulfate, followed by a fall in the output, frequently to zero. In answer to the possible criticism that we made only one determination prior to the injection of sodium thiosulfate, we would merely point out that the second determination, made immediately after the injection, showed a larger amount than the first except in a few cases, in which no arsenic was found at all, and we feel that our series of cases is sufficiently large to afford validity to our results.

Our technic has been as follows: The patient is given a sterile quart glass jar with a glass top (in order that no metal which might possibly contain arsenic may come in contact with the urine) and is instructed to fill the jar with portions of each urination over a twenty-four hour period. When this is brought back he is instructed to empty his bladder, is given 1 Gm. of sodium thiosulfate in 10 cc. of sterile distilled water intravenously and is then instructed to urinate directly into a second jar until it is filled rather than to use samples over a twenty-four hour period.

Thus the second jar contains the first output of any arsenic that may be released by the injection of sodium thiosulfate. Both specimens are then tested by the Gutzeit [9] method with a control. This test, which probably is the best method for the determination of arsenic in the urine, depends on the development of a yellow to brownish color in a strip of sensitized paper as the result of contact with volatile arsine gas or hydrogen arsenite (AsH_3), which is liberated through the chemical interaction of dilute hydrochloric acid, zinc and urine which has been concentrated by partial evaporation. By comparison with color standards, the amount of arsenic present can be estimated according to the length of the band of color and its intensity. All of the reagents must be arsenic free, and to avoid the possibility of false reactions a control should accompany each test.

With few exceptions, the specimen of urine collected immediately after a single injection of sodium thiosulfate has shown a definite and in some cases a marked increase over the first specimen. A number of investigators have insisted on the necessity of using the fresh crystals of sodium thiosulfate, which are to be dissolved just prior to administration, but we have never felt that sufficient proof exists of the superiority of this preparation over the ampules of sodium thiosulfate in solution, and we have always used the latter.

SUMMARY OF TABLE

Arsenic determinations were made on the urine of forty-nine patients with a variety of cutaneous disorders in whom arsenic was suspected of being a possible etiologic factor, the tests being made before and immediately after a single injection from an ampule of a stable solution of 10 cc. of 10 per cent sodium thiosulfate. Of these, 8 per cent failed to show any arsenic either before or after injection, 12 per cent showed a decrease in the output of arsenic after the injection. Eighty per cent showed an increase in the excretion of arsenic; in some cases a hundred times as much was excreted at the second test as at the first test, and the increase was seldom less than tenfold. It may be noted that in some cases in which subsequent determinations were made during the course of administration of sodium thiosulfate there was a further increase in the excretion of arsenic and that in all such cases there was a gradual decline in excretion, probably indicating that arsenic which had been stored in the tissues had been eliminated.

These are unselected cases and represent all of the cases which we have investigated in this manner during the past four years.

CONCLUSIONS

A statistical study of forty-nine cases of various dermatologic conditions in which arsenic was suspected of being a causative factor and in which arsenic determinations were made on the urine before and immediately after a single injection of sodium thiosulfate demonstrates clearly that an increase in the excretion of urinary arsenic usually follows the injection of sodium thiosulfate.

2007 Wilshire Boulevard.

9. Autenreith, Wilhelm: Detection of Poisons, ed. 4, translated by William H. Warren, Philadelphia, P. Blakiston's Son & Co., 1915, p. 233.

Clinical Notes, Suggestions and New Instruments

ANAEROBIC BETA HEMOLYTIC STREPTOCOCCUS MENINGITIS OF OTITIC ORIGIN TREATED WITH SULFANILAMIDE AND CULMINATING IN COMPLETE RECOVERY

FRED W. SMITH, M.D., PHILADELPHIA; KARL F. MAYER, M.D., GLENSIDE, PA.; HORST A. AGERTY, M.D., UPPER DARBY, PA.; RUSSELL H. FOWLER, AND WILLIAM C. LAYTON, M.D., ABINGTON, PA.

Although the number of patients who have recovered from meningitis caused by the beta hemolytic streptococcus after treatment with sulfanilamide appears to be growing rapidly, we are able to report for the first time, to our knowledge, a case of meningitis caused by an anaerobic beta hemolytic streptococcus with recovery under sulfanilamide therapy.

REPORT OF CASE

E. B. S., a white girl, aged 21, first seen by one of us July 29, 1937, complained of sore throat and backache. The past personal and family histories were noncontributory. The temperature was 103.4 F. and the throat was acutely inflamed and covered with numerous white patches. A culture was taken and the following day was reported as showing a few pneumococci, Streptococcus viridans and Micrococcus catarrhalis. In the meantime she had been given 10 grains (0.65 Gm.) of sulfanilamide three times a day. This was discontinued the following day after we received the bacteriologic report on the culture of material taken from the throat, and a slight cyanosis developed. The throat infection had practically subsided and the temperature had returned to normal by August 1. August 2 an acute otitis media developed on the left side, and adequate drainage was secured within twenty-four hours by a myringotomy performed by an otologist. No culture was taken of the discharge. There was a rapid progressive improvement in her condition and within ten days the discharge had gradually ceased and the temperature was normal. The patient was symptom free and went to the seashore to recuperate.

August 17 she returned from the shore with an acute exacerbation of all symptoms. The left ear was discharging and she complained of intensive supra-orbital and temporal headache on the left side. Examination revealed a profuse pulsating sero-

Dr. Smith died Feb. 20, 1938.

Dr. Fowler and Dr. Layton are members of the resident staff of Abington Memorial Hospital.

Dr. John Eiman, pathologist of the Abington Memorial Hospital and director of the laboratories, cooperated heartily in this case.

purulent discharge from the left canal with a sagging of the superior and posterior canal walls and slight tenderness over the mastoid tip. The temperature was 102 F., and she had considerable nuchal rigidity but no other neurologic manifestations at that time.

She was admitted to the Abington Memorial Hospital August 18 for operation, with a diagnosis of acute mastoiditis on the left side. On admission she was drowsy and toxic and the deep reflexes were somewhat accentuated. Otherwise her condition and manifestations were as already noted. The temperature was 103.2 F., pulse rate 120, respiratory rate 32. The leukocyte count was 13,800 cells per cubic millimeter, with 88 per cent polymorphonuclears. The blood cultures grown in hormone and brain broths showed no growth. Preoperative roentgenograms by Dr. J. Donald Zulick to determine whether the petrous pyramid was involved showed no evidence of involvement of the petrous pyramid but showed incomplete occlusion of the cent polymorphonuclears; the temperature varied slightly but remained between 99 and 100 F. The results of neurologic and ophthalmoscopic examinations were negative, and the wound was redressed and found to be in a satisfactory condition. By August 26 the leukocyte count had returned to normal and, although the headache was variable, it persisted and did not yield to ordinary measures.

August 27, the tenth postoperative day, the temperature suddenly went up to 103.2 F. and the white count rose to 14,600 with 88 per cent polymorphonuclears. There were present at that time nuchal rigidity, diplopia, accentuation of the deep reflexes, a positive Kernig sign and a positive Brudzinski sign. Fifteen cc. of prontosil was given intramuscularly every eight hours. August 28 a spinal tap was done and 16 cc. of turbid fluid was removed under 360 mm. of water pressure. After removal of 16 cc. of spinal fluid the closing pressure was 180 mm. of water. The initial spinal fluid examination showed

Spinal Fluid Analysis

Date	Quantity, Cc.	Pressure*	Appearance	Cell Count	Differential	Sugar†	Chlorides†	Globulin	Smear	Culture
8/28	16	360	Turbid	360	100% polymorphonuclears	..	...	Increased	Occasional gram-positive diplococci and short chains	Anaerobic beta hemolytic streptococcus
8/29	15	450	Cloudy	1,800	95% polymorphonuclears 5% mononuclears	10	618	Increased	Occasional gram-positive diplococci and short chains	Anaerobic beta hemolytic streptococcus
8/30	15	290	Slightly cloudy	1,500	73% polymorphonuclears 22% mononuclears 5% lymphocytes	..	660	Increased	Occasional gram-positive diplococci	Anaerobic beta hemolytic streptococcus
8/31	6	185	Mildly turbid	610	78% polymorphonuclears 22% mononuclears	25	648	Increased	No organisms	No growth
9/ 1‡	12	240	Turbid	1,950	79% polymorphonuclears 18% lymphocytes 3% mononuclears	43	678	Markedly increased	1 pair gram-positive diplococci	No growth
9/ 2	15	300	Slightly cloudy	380	38% polymorphonuclears 59% lymphocytes 2% monocytes	..	...	Increased	No organisms	No growth
9/ 3‡	10	290	Slightly cloudy	343	.....	41	700	Increased	3 pairs gram-positive diplococci	No growth
9/ 4	..	270	Slightly cloudy	300	.....	..	...	Increased	No organisms	No growth
9/ 5	12	230	Slightly hazy	116	5% polymorphonuclears 91% lymphocytes 4% large mononuclears	..	...	Increased slightly	No organisms	
9/ 6	10	240	Clear	174	20% polymorphonuclears 80% lymphocytes	58	730	Increased slightly	No organisms	No growth
9/ 7	..	290	Clear	118	6% polymorphonuclears 93% lymphocytes 1% monocytes	..	...	Increased	No organisms	
9/ 9	8	180	Clear	57	100% lymphocytes	58	724	Increased slightly	No organisms	No growth
9/11	8	175	Clear	50	100% lymphocytes	59	710	Increased slightly	No organisms	No growth
9/15	6	140	Clear	9	100% lymphocytes	64	730	Increased slightly	No organisms	No growth

* Millimeters of water pressure.
† Milligrams per hundred cubic centimeters of spinal fluid.
‡ Gram-positive diplococci were seen on smear, but the cultures grown both aerobically and anaerobically were sterile. We believe that the sterile cultures resulted from either the germicidal or the bacteriostatic effect of sulfanilamide in the spinal fluid.

cells on the left side with a coalescence of the mastoid cells that lie over the sinus.

August 19 a simple complete mastoidectomy was done on the left side. There was no exposure of the dura or sinus and no evidence of a pathologic condition of the bone extending into any portion of the petrous bone. Culture of material from the mastoid, grown aerobically, showed no growth, while the smear showed many pus cells but no bacteria. Clinically it was a typical hemolytic streptococcus infection. Within the first twenty-four hours the patient was given two prophylactic intramuscular injections of 15 cc. of the disodium salt of 4-sulfamidophenyl-2'-azo-7'-acetylamino-1'-hydroxynaphthalene-3', 6' disulfonic acid (prontosil).

The immediate postoperative condition of the patient was good and improvement was rapid. The headache and nuchal rigidity disappeared entirely within the first few days and the temperature came down by lysis and was essentially normal by the third postoperative day (August 22). The results of all neurologic examinations were negative, and a satisfactory convalescence seemed to be established.

On the fifth postoperative day (August 24) a frontal headache developed. The leukocyte count was 12,500 with 88 per 360 leukocytes per cubic millimeter, all polymorphonuclear The globulin was increased. Smear showed occasional gram-positive cocci in pairs and in short chains. Culture showed anaerobic beta hemolytic streptococci. A blood culture taken August 28 showed no growth after five days of both aerobic and anaerobic incubation. The prontosil was increased to 30 cc. every eight hours.

August 29 the patient's status was about the same. During the previous night the temperature had been up to 104.4 F. The case was seen in consultation, from a neurologic standpoint, with Dr. J. R. VanMeter, in order to detect any evidence of a lateral sinus thrombosis or localized collection of extradural pus, which might make it necessary to revisualize the operative field. Such was not found to be the case, and the diagnosis of a purulent meningitis of otitic origin was confirmed. It was decided to rely entirely on sulfanilamide[1] by oral administration,

1. The dose of sulfanilamide was regulated by the patient's clinical condition, because at the time this patient was under treatment we did not have the facilities that are now available at the hospital for the determination of the concentration of sulfanilamide in the blood stream. The drug was continued after cyanosis developed because of the marked improvement in the clinical condition and because of the probable fatal outcome if the drug was stopped.

since the concentration of this drug in the cerebrospinal fluid is only slightly less than that in the blood. The patient was given a total of 60 grains (4 Gm.) a day, administered 10 grains (0.65 Gm) every four hours. The weight of the patient was about 110 pounds (49.9 Kg.).

On the following day the temperature came down to normal. It remained normal during the remainder of the illness except for one day (August 31) when, because of cyanosis, two doses of the sulfanilamide were omitted. At that time the temperature rose to 102.4 F. The drug was immediately resumed, despite the cyanosis, which persisted during the remainder of the administration of the drug. The temperature immediately returned to normal. It is evident from the accompanying table that with this brief omission of sulfanilamide therapy the patient's symptoms became more pronounced and the spinal fluid changes were more strongly positive.

Under the sulfanilamide therapy and a daily spinal tap, the patient's condition improved rapidly. At no time was she disoriented or uncooperative. Following the onset of the sulfanilamide therapy the patient was quite comfortable, except for pain and tenderness at the site of the prontosil injections. Except for some diplopia and left convergent squint the results of neurologic examinations were negative by September 6, the eleventh day of the meningitis. The diplopia gradually disappeared, as did the associated left convergent squint. The results of ophthalmoscopic examinations were consistently negative. No evidence of lateral sinus thrombosis was present at any time.

The spinal fluid improved consistently, as shown in the table. Two transfusions of 200 cc. each were given to maintain the hemoglobin and erythrocytes near a normal level. Daily complete blood and Schilling counts were done. The leukocyte count was normal after August 31. The hemoglobin ranged from 10 to 12.5 Gm. The erythrocytes ranged from 3,550,000 to 4,800,000.

Blood chemistry, including tests for urea, sugar, chlorides and carbon dioxide, was at all times normal.

September 7 the sulfanilamide was reduced to 30 grains (2 Gm.) daily, 5 grains (3.3 Gm.) being given every four hours. September 14, administration of the drug was stopped. The mastoid wound healed normally. The patient was discharged September 18. She has been seen repeatedly since then and no residual symptoms have been found.

DESCRIPTION OF STREPTOCOCCUS

An obligate anaerobic beta hemolytic streptococcus was isolated on a blood agar plate by the gaseous displacement and palladinized asbestos technic of Weiss and Spaulding.[2] The colony was slightly granular, grayish white and opaque, with an entire border approximately 1 mm. in diameter and surrounded by a zone of hemolysis 3 mm. in diameter. This strain occurred in chains of from eight to twelve cocci when grown in brain broth mediums under anaerobic conditions. It required strict anaerobic conditions for growth. It has failed repeatedly to grow aerobically on blood agar plates or in unheated brain broth tubes after repeated transplants on anaerobic blood agar slants.

SUMMARY

1. A patient with meningitis of otitic origin caused by an anaerobic beta hemolytic streptococcus recovered.

2. Oral sulfanilamide therapy was relied on exclusively except for the first two days of the disease, when prontosil was given intramuscularly.

3. Following the temporary cessation of sulfanilamide therapy August 31 there was an aggravation of symptoms and the results of laboratory examinations were more pronounced.

4. It appears that patients with anaerobic beta hemolytic streptococcus meningitis may be favorably treated with sulfanilamide.

5. Anaerobic culture procedures in routine hospital bacteriologic studies are important.

2. Weiss, J. E., and Spaulding, E. H.: J. Lab. & Clin. Med. **22**: 726 (April) 1937.

VAGINITIS AND VULVITIS ASSOCIATED WITH AN EXCESS OF ESTROGEN IN THE BLOOD

EVAN SHUTE, M.B., F.R.C.S.C., LONDON, ONT.

The vulvovaginitis that develops in many women during and after the menopause, whether it is natural or induced, has been ascribed for years to cessation of the ovarian function. Clinically it is associated with an atrophy and depilation of the vulvar and perianal skin and a shiny, atrophic and smoothed appearance of the vaginal mucosa. The latter usually assumes a raw, scarlet color. At any time after these gross changes commence, the patient may complain of intense local pruritus, or burning and tingling, or vague and scarcely describable forms of paresthesia. The usual local applications fail to give relief for more than a short time.

One of the most important of recent therapeutic advances has been the use of estrogenic substances, either given by means of intramuscular injection or applied locally as suppositories, to relieve this distressing condition.[1] This is assumed to be a logical and obvious example of substitution therapy. However, any practicing gynecologist is aware that a very definite proportion of these cases, whose gross appearance in no way distinguishes them from cases that react satisfactorily, are not relieved by such estrogen therapy. Indeed they may actually be made worse by it. Much less attention has been paid to these cases than they merit.

Some light is cast on this problem by the recent reports of Frank and his collaborators,[2] who showed that all twelve surgical castrates tested excreted appreciable amounts of estrogen in the urine. In only two of the five cases of physiologic menopause that they studied was the excretion of estrogenic substance nil; one of these two showed estrogen in the blood. In a series of twenty-four surgical castrates, eleven roentgenologic castrates and ten natural postmenopausal cases, Salmon and Frank[3] found that in only 40 per cent of the forty-five women were the vaginal smears uniformly negative for estrogen. In 30 per cent estrogen was present occasionally, and in the remaining 30 per cent estrogen smears were always to be found. Novak and Yui[4] reported that of 804 women in whom curettage was done from one to twenty-four years after their last menses, forty showed endometrial hyperplasia, presumably of estrogenic origin. A review of the other evidence pointing in the same general direction has been given elsewhere[5] and need not be repeated here.

At first sight it would seem paradoxical that estrogenic activity should still be apparent in the female organism after castration or the climacteric. However, there is so much evidence for this conclusion that it is inescapable. The recent reports of estrogenic activity in the anterior pituitary body[6] and in the adrenal cortex[7] may serve to explain the source of at least some portion of this estrogenic material.

Suspecting that these women with a vaginitis which estrogen therapy did not relieve, and even occasionally aggravated, might be women who already displayed a definite or even excessive estrogenic activity, I began testing their blood serums for the presence of an estrogen cycle by the method which I have evolved.[8] I found that these women had either a constant

From the Department of Obstetrics and Gynecology, University of Western Ontario Medical School.

Dr. J. H. Geddes gave the author permission to describe case 1 and Dr. A. G. Calder his permission to describe case 3.

1. Kaufmann, C.: Clinical Uses of the Female Sex Hormone, J. Obst. & Gynaec. Brit. Emp. **44**: 310 (April) 1937.

2. Frank, R. T.; Goldberger, M. A., and Salmon, U. J.: Oestrogenic Substances in the Blood and Urine After Castration and the Menopause, Proc. Soc. Exper. Biol. & Med. **33**: 615 (Jan.) 1936.

3. Salmon, U. J., and Frank, R. T.: Hormonal Factors Affecting Vaginal Smears in Castrates and After the Menopause, Proc. Soc. Exper. Biol. & Med. **33**: 612 (Jan.) 1936.

4. Novak, Emil, and Yui, Enmei: Relation of Endometrial Hyperplasia and Adenocarcinoma of the Uterus, Am. J. Obst. & Gynec. **32**: 674 (Oct.) 1936.

5. Shute, E. V.: Notes on the Menopause, Canad. M. A. J. **37**: 350 (Oct.) 1937.

6. Pfaltz, H.: Zur Kenntnis Gonadotrop Wirkender Hormone, in Festschrift f. E. C. Barell, Basel, Reinhardt, 1936.

7. Englehart, E.: Ueber den Nachweis von lutein- und östrinartigin Wirkstoffen in der Nebennierenrinde, Zentralbl. f. Gynäk. **61**: 1098 (May 8) 1937.

8. Shute, E. V.: Resistance to Proteolysis Found in the Blood Serum of Aborting Women, J. Obst. & Gynaec. Brit. Emp. **42**: 1071 (Dec.) 1935; Is Oestrin the Cause of Resistance to Proteolysis Found in the Blood Serum of Aborting Women? ibid. **42**: 1085 (Dec.) 1935; Anti-proteolytic Properties of Human Blood Serum in Cases of Miscarriage and Premature Labour, ibid. **44**: 253 (April) 1937.

excess of blood estrogen or a true estrogen cycle, two types of which Fluhmann [9] has described. It seemed rational in such cases to attempt therapy with substances antagonistic to estrogen, such as thyroid extract,[10] small doses of preparations of gonadotropic substances,[11] or, best of all, wheat germ oil.[12]

The number of cases of estrogenic vulvovaginitis which have been seen has been small, but their response to therapy has been striking. As this clinical entity has not as yet been described, so far as I know, the clinical records are given in some detail. Case 4 has been reported previously [5] and so will not be repeated in extenso.

As all these patients were seen recently in my private practice, I suspect that this type of vulvovaginitis is not uncommon. Unfortunately, no biopsy studies before or after therapy could be attempted, although they would be of unusual interest.

CASE 1.—Mrs. J. S. T., aged 73, seen June 3, 1937, stated that for the past month she had experienced a severe burning and itching of the vulva. She said that this was aggravated by urination and that it sometimes awakened her at night. Moreover, at times she had the sensation of prolapse. The symptoms extended to the anus but were less intense there. She had been unable to sit on a hard chair of late. There was no pruritus elsewhere nor were there other complaints.

The menopause had been uneventful and occurred at the age of 53. Since then there had not been any bleeding, leukorrhea or nervous symptoms. In 1926 a plastic operation for second degree uterine prolapse had been done. There had been three children; the oldest was born when the patient herself had weighed 99 pounds (45 Kg.) and was said to have weighed 14½ pounds (6.6 Kg.).

Examination revealed nothing of note except in the vulvar region. The labia majora and minora were thickened, pallid, depilated and parchment-like in appearance and consistency. The perianal skin was red and desquamated. The vaginal mucosa was raw, reddened and so tender that it would scarcely permit the intrusion of a tiny speculum.

A blood test by my technic revealed an excess of estrogenic substance. Accordingly, she was given bulk cold-pressed wheat germ oil according to my routine; [12] that is, 12 drachms (45 cc.) on the first day to ensure neutralization of the excess of estrogenic substance in the circulation, followed by 1 drachm (3.75 cc.) each day.

There was prompt and decided relief, but some of the symptoms persisted. The physical changes were striking. The labia became soft and pliable and the raw vaginal mucosa assumed a much more normal appearance, but there was no change in the desquamation of the perineal body and perianal area, which had left the sensitive dermis exposed. The patient observed that there seemed to be a definite exacerbation of her distress every two weeks, lasting about three days.

The dose of oil was increased to 4 drachms (15 cc.) daily. On this she improved temporarily and was quite free of distress when seen July 2. However, July 8 the distress recurred with great severity. The anal region was especially tender. Accordingly the dose of oil was increased to 4 drachms three times each day, but this proved ineffectual. Therefore 4 drachm doses four times a day were tried July 17, and after five days she was completely free from symptoms for the first time. The mucosa of the anus and introitus vaginae was violaceous, of normal consistency and no longer hypersensitive, and since that time this dose has kept her free from symptoms and signs of a recurrence of the vulvovaginitis.

CASE 2.—Mrs. F. G., aged 53, had been under observation occasionally since June 1934, at which time there had been irregular menses and considerable psychic depression. Nothing of importance was found but a secondary anemia, occasional cardiac extrasystoles and a fibroid uterus of small size requiring no intervention. The basal metabolic rate was —4 per cent.

May 4, 1937, she complained of a troublesome leukorrhea, which necessitated wearing a pad, and vulvar pruritus. There was no dysuria. There was a severe paresis of the left upper extremity with some accompanying paresthesia but no hyperalgesia. The mental depression had disappeared but hot flushes and severe night sweats persisted. The hemoglobin was 82 per cent (Sahli).

On examination the vaginal mucosa was tender, raw and red and was bathed with a heavy white discharge, which did not show gonococci or trichomonads. Externally there was some redness from irritation but nothing else of note. The blood showed an excess of estrogenic substance.

She was given bulk cold-pressed wheat germ oil as in the preceding case, in the hope that its content of vitamin B_1 would clear up the neuritis of the left arm and that its content of vitamin E would control the estrogenic excess in the body. To give her more energy and assist the latter action of the oil, she was put on thyroid extract, 1 grain (0.06 Gm.) daily.

May 15 no change in the extremity could be detected, but the vagina seemed much less sore and also the hot flushes and night sweats were milder. Grossly the vaginal mucosa appeared immensely improved, although it was still bright red and slightly tender. The oil dosage was increased to 4 drachms daily. In addition a commercial preparation of synthetic B_1 was given.

By the 25th, the vaginal mucosa was normal and the discharge minimal. The arm was unchanged. By June 5 the paresthesia in the arm had gone but there was no change in the paresis. The vagina had remained normal and symptom free. The B_1 dosage was increased from 50 units three times a day to 500 units three times a day. The arm soon began to show great improvement and was almost normal in mobility and strength by July 1. It has been normal since August 1. The vaginal condition has also remained normal.

CASE 3.—Mrs. R. M., aged 26, when seen Dec. 16, 1936, had had vaginal irritation and urinary distress for a month. There had been a leukorrhea for the preceding ten months, and this had been treated with a proprietary preparation containing acetarsone (Devegan tablets) on the assumption that it was due to Trichomonas. No trichomonads were found, but antitrichomonas therapy was continued. The cystitis had subsided temporarily and seemed to require no treatment at the moment. There had been a severe menorrhagia since the birth of her baby one year previously, and considerable premenstrual dysmenorrhea had accompanied this.

The cystitis recurred in January 1937 and responded well to methenamine therapy. There was a high blood estrogen January 2, just after the conclusion of menstruation (when it should be low), and the vaginitis had persisted in a subacute form in spite of the antitrichomonas treatment. Accordingly, a trial of cold-pressed wheat germ oil was made in the dosage previously described. At once the vaginitis improved. By February 5 she remarked that she felt well for the first time in many months. The menorrhagia and dysmenorrhea had also disappeared promptly and thoroughly. The vagina looked normal. She stopped the wheat germ oil therapy.

The vaginitis recurred February 11 and she began taking the oil again. On the 16th there was no vaginitis but some cystitis, which again responded well to methenamine. The March period was normal and painless again. The oil was stopped. By March 5 she had gained 4½ pounds (2 Kg.) and had lost the anxious and harassed appearance which had characterized her since her first visits.

By April 6 there had been a mild recurrence of the vaginitis and leukorrhea. Accordingly she was advised to take the wheat germ oil in the premenstrual week each month. On that regimen she has remained free from vaginitis, menorrhagia and dysmenorrhea since.

CASE 4.—Mrs. E., a widow, aged 60, first seen March 23, 1936, had felt well until May 1934, when urethral dysuria and some leukorrhea had developed. The menses had gradually stopped at the age of 54, and the menopause had been accompanied by menorrhagia and mental depression.

When first seen she had a profuse serous leukorrhea and reddening of the labia. The vaginitis was extreme and scarcely permitted the intrusion of a speculum. The mental state accompanying the intolerable burning pain was pitiable. Before the blood was tested for its estrogen content she was given 1,000 rat units of an estrogen preparation hypodermically. This

9. Fluhmann, C. F.: Oestrogenic Substances in the Blood of Women, Am. J. Obst. & Gynec. **32**: 612 (Oct.) 1936.
10. Van Horn, W. M.: The Relation of the Thyroid to the Hypophysis and Ovary, Endocrinology **17**: 152 (March-April) 1933.
11. Reynolds, S. R. M.: A Predisposing Factor to the Normal Onset of Labor: the Probable Role of Estrin, Am. J. Obst. & Gynec. **29**: 630 (May) 1935.
12. Shute, E. V.: Relation of Deficiency of Vitamin E to the Antiproteolytic Factor Found in the Serum of Aborting Women, J. Obst. & Gynaec. Brit. Emp. **43**: 74 (Feb.) 1936.

appeared to aggravate her distress immensely. She became more nervous, had hot flushes and felt too hot to sleep at night, and the vaginal mucosa looked even more acutely inflamed. By April 6 a right-sided inguinal adenitis had developed and, since the estrogenic substance of the blood had been found elevated, she was given wheat germ oil (ether extracted) by the usual routine.

By April 10 there was great improvement. By the 17th she said that she felt "better than in months." The leukorrhea had ceased. The inguinal adenitis had almost disappeared. The vaginal mucosa was still slightly reddened but seemed nearly normal. The vulva appeared normal. By May 19 she had begun to look placid for the first time since she had been seen, and she did not have vaginitis or adenitis. However, she seemed to be one of the cases of idiosyncrasy to wheat germ oil that we have found. A widespread urticaria developed every time she returned to the oil after being off oil therapy until the urticaria had cleared up. The patient later resorted to medical care elsewhere.

SUMMARY

1. Women may continue to show a high content of estrogenic substance in the blood even many years after the menopause.

2. A type of vulvovaginitis is correlated with this fact; it responds to treatment with wheat germ oil.

280 Queens Avenue.

FEVER OF UNDETERMINED ORIGIN IN A PATIENT WITH TRAUMATIC BRACHIAL ANEURYSM CURED BY EXCISION

E. V. KANDEL, M.D., CHICAGO

A recent case of traumatic brachial aneurysm presented several interesting features and seems worthy of reporting:

L. M., a white American laborer, aged 24, in the cold and freezing rooms of a Chicago packing company was referred to the Hematology Clinic of the University of Chicago, Oct. 15, 1935, because "abnormal cells" had been seen in blood films. He complained of chills, fever, nausea and vomiting during the last month and a half, a general sick feeling for the last four years, and pain in the right arm for four years. In 1925 he had been shot in the right arm, the 0.22 bullet entering about 4 cm. above the flexor crease on the lateral surface of the biceps brachii tendon and ranging upward. It was removed from the arm two hours later and the wound healed, the patient thought, without any infection. The sole resulting disability was limitation of extension of the forearm. In 1931 the right arm had been violently extended, and the patient experienced a severe tearing pain in the medial region of the elbow. The arm was quite painful, keeping him from work for ten days. A roentgenogram at that time was said to show a "soft tissue tumor," and surgical removal was advised but refused. Since then moderate pain persisted, the patient missing about one day's work a month because of it. During the two or three years prior to our examination the patient would frequently come home from work feeling very weak, flushed and feverish, although his temperature was never determined. Intermittent "rheumatic" pains in the knees and ankles occurred at this time but were attributed to the cold environment in which he worked. In 1934 the patient began to have attacks of numbness in the thumb and first two digits of the right hand. These would last a few days and came at infrequent intervals and were always associated with an increase of the pain in the region of the tumor on the right arm. In June 1935 the numbness had become so troublesome that he consulted the company surgeon, who recommended removal of the tumor and freeing of the median nerve. This was done, June 4, and at operation the egg-size tumor was found to consist of a fibrous tissue mass adherent to an aneurysm of the brachial artery. The tumor was removed but no effort was made to dispose of the aneurysm. The operative wound healed by first intention. From then until his admission to this clinic pain in the wound prevented the patient from doing any but the lightest work. One night at the end of August the patient awoke at 3 a. m. with a severe chill and pain in the knees and ankles. The chills recurred at frequent intervals, and two days later he was found to have a temperature of 104 F. Subsequently nausea, vomiting and a moderate diarrhea developed, which lasted for three days, accompanied by frequent elevation of temperature. For seven days he was studied at the Cook County Hospital and no cause for the fever was ascertained. After being discharged from there he improved somewhat and returned to work, but within two weeks the chills recurred. Beginning September 30 he had several chills a day, accompanied by drenching sweats and a fever as high as 103 F. This episode was just subsiding when he came to the clinic.

Other details of his past history included typhoid when he was 3 years old and gonorrhea, uncomplicated, when he was 21. He had been married for a year and a half. Inquiry disclosed only palpitations and infrequent epistaxis in the last six months. The family history was irrelevant. None of his associates at work and no member of his family suffered from any condition similar to his.

On examination the patient was pale and rather pudgy and looked sick. His temperature was 98 F. and pulse 100 per minute. The heart was normal in size and shape; no murmurs were detected. The lungs were normal on physical examination. The blood pressure was 114/88 in the left arm, 88/? in the right arm and 124/80 in the legs. The abdomen and genitalia were normal and the spleen and liver not palpable. On the medial surface of the right arm was a healed scar 8 cm. long extending upward from the elbow crease. At the lower end of the scar was a visible, walnut-size tumor that pulsated synchronously with the radial pulse. It was firmly attached to the surrounding tissues, and a systolic thrill could be felt and a soft rough systolic bruit heard over it. One received the impression of local heat over the tumor. The arm below the aneurysm was definitely warmer than the opposite one. It was noticed that the right hand throbbed slightly in time with the heart beat. Capillary pulsation was seen in the nails of the right fingers. There was hypesthesia to pin prick and cotton wool over the skin representation of the median nerve, but there was no motor palsy. Examination of the blood at that time showed hemoglobin 15.2 Gm., erythrocytes 4,210,000, leukocytes 13,500. The differential count was neutrophils 70 per cent, lymphocytes 22 per cent, monocytes 4 per cent, eosinophils 4 per cent; no abnormal red or white cells were seen. The sedimentation rate was 55 mm. per hour. The urinalysis was normal in every respect.

October 26, eleven days later, he was hospitalized. His general condition and physical examination were unchanged. The results of further studies in the hospital were as follows: x-ray examination of the chest was negative; five blood cultures were negative; sheep cell agglutination, none; melitensis group agglutination, none; typhoid-paratyphoid-dysentery group agglutination, none; tularensis group agglutination, none; skin tests and agglutination for Trichina, negative; stool cultures and examination for parasites, negative; serologic reaction, negative; urine, normal on all occasions.

It was suggested that the aneurysm might, in reality, be an infected arteriovenous fistula, and the clinical symptoms the result of a mild septicemia of which the aneurysm was the focus. The surgical consultant did not think there was evidence for an arteriovenous fistula, because compression of it did not slow the pulse or raise the systemic blood pressure, although it obliterated the radial pulse. Because of the pain and neural involvement, excision was recommended. The operation was performed by Dr. F. E. Kredel, November 8, under ethylene-ether anesthesia. The old scar was excised; an aneurysm about 8 cm. long and 5 cm. broad, extensively adherent to the surrounding structures and the median nerve posteriorly was exposed. There were "no extensive venous communications." The aneurysm was dissected off the median nerve and excised after ligation of the dilated entering portion of the brachial artery. During separation from the nerve it was slightly injured and immediately repaired with blood vessel silk in the perineurium. The wound was closed without drainage. The postoperative course was uneventful, the wound

Dr. Kandel is Douglas Smith Fellow, Department of Medicine, University of Chicago Clinics.

healing by first intention. The temperature, which had reached 100.2 F. daily, became and stayed normal. The sensory loss was moderate and unchanged on discharge from the hospital November 18. For the first five days after the operation the right hand was moderately swollen and was definitely cooler than the left, but by the day of discharge this disparity had completely disappeared. The patient's course since leaving the hospital has been excellent; full and painless use of the right hand and arm were present April 13, 1936. In December 1936 the sensory loss had completely disappeared and there was a definite but mild hyperesthesia of the volar surface of the second and third right digits. When queried by telephone in September 1937, the patient stated that he was perfectly normal and had experienced no chills, fever, malaise or rheumatic pain since the operation. He has been working at his old job in the refrigerated rooms and considers himself cured as a result of the surgical intervention.

Immediately after the aneurysm was removed it was cut open, and a large portion of the wall and about one half of the enclosed mural thrombus were placed in a flask of plain broth for culture. The only organism recovered was a diphtheroid bacillus in pure culture. The cultural characteristics of the organism were not recorded and no further work on its identity was done.

When examined in detail, the remainder of the aneurysm was found to have three openings into its inner aspect, of which two were obviously the entrance and exit of the brachial artery. These were about 1 cm. apart and in the wall intervening were calcific plaques. At both sides of these openings were cystic dilatations almost completely filled with adherent mural thrombi with vegetative surfaces. In the wall of one of the outpouchings was the third opening, about 2 mm. in diameter and extending to the outside. No definite venous remnant was identified grossly, and no block of this region was fixed for section.

Microscopically, the organized thrombi contained many calcified areas. They were surrounded by a loose connective tissue wall, which blended peripherally with the artery wall, which appeared normal in every respect. In this loose connective tissue was a moderate, irregular round cell infiltration with plasma cells and eosinophils in small numbers. In no section was there any endothelium detected over the surface of the thrombi.

COMMENT

The justification for reporting this case is its similarity to that of Hamman and Rienhoff,[1] which we had in mind when the chills, fever and other symptoms in our case were related to the traumatic aneurysm of the arm. Their patient, however, was much sicker, had a definitely arteriovenous aneurysm, had a Streptococcus viridans bacteremia and had vegetations in the aneurysm from which a similar organism was cultured. Their patient, too, was completely cured by excision of the aneurysm. In our case the clinical disagreement with the diagnosis of infected arteriovenous aneurysm was unfortunately not adequately settled at operation, for the surgeon was not certain that the veins ligated in the course of the operation emerged from the aneurysm; later, cultures were taken of almost half of the specimen and it was subsequently destroyed. The microscopic examination disclosed remnants of chronic inflammation, but the most charitable examiners of the specimen were loath to agree that this was adequate to account for the chills and fever and general disability from which the patient sought relief. However, the greater portion of thrombi, especially the looser ones, were put into the culture flask with the portion of the wall. The bacteriologic evidence likewise is not too helpful, for a diphtheroid bacillus, although rarely encountered as a contaminant in the surgical bacteriologic laboratory, may enter cultures in that manner. Subsequent tests of the patient's blood against a diphtheroid bacillus for antibodies were not made.

On the other hand, the operation seems to have effected a clinical cure, for now, almost two years later, the patient has no more of the symptoms that he presented when he came to the clinic. He considers himself well as a result of the operation. Further, the complete absence of any vestige of an endothelial covering of any of the thrombi examined microscopically would not be contrary to a belief that they were infected in a low-grade manner. It should be noted that subsequent to an injury to the tumor, four years before our examination, the aneurysm had been painful, and the patient had suffered mildly from fatigue, feverishness and "rheumatic" pains. The acute phase of his illness, moreover, followed surgical exploration of the region of the aneurysm. Finally, diphtheroid bacilli and diphtheroid-like streptococci are capable of producing a chronic bacteremia.[2] Although I feel very strongly that a chronic infection in an arteriovenous fistula with undetected bacteremia is the correct interpretation of the febrile illness described, it is not improbable that there was solely an endarteritis of low virulence in an aneurysm.

None of the standard surgical textbooks describe the occurrence of infected vegetations in traumatic aneurysm, and the case of Hamman and Rienhoff seems to be the sole example in the available literature. Because of the possibilities of infection and the inevitable stasis and mural thrombosis associated with traumatic aneurysms, it seems odd that more cases have not been noted.

CONCLUSION

In a patient suffering an intermittent fever of obscure etiology the only abnormality discovered after an extensive study was a painful, ten year old traumatic aneurysm of the right brachial artery. Excision of this was followed by a complete disappearance of the patient's complaints. It is believed, but not proved, that a diphtheroid bacillus, cultivated from broth in which a portion of aneurysm and its contained thrombi were cultured, was the etiologic agent of the "fever of unknown origin."

1. Hamman, Louis, and Rienhoff, W. F., Jr.: Subacute Streptococcus Viridans Septicemia Cured by Excision of an Arteriovenous Aneurysm of the External Iliac Artery, Bull. Johns Hopkins Hosp. **57**: 219-234 (Oct.) 1935.

2. Ferguson, J. A.; Murdock, T. P., and Welch, Henry: Significance of Streptococci That Resemble Diphtheroids Recovered from Blood Cultures in Subacute Bacterial Endocarditis, J. Lab. & Clin. Med. **19**: 1304 (Sept.) 1934. Welch, Henry; Murdock, T. P., and Ferguson, J. A.: Subacute Bacterial Endocarditis Produced in Rabbits with Streptococci That Resembled Diphtheroids, ibid. **21**: 1264 (Sept.) 1936.

EXPANDING AIRWAY TUBE

JAMES T. GWATHMEY, M.D., NEW YORK

The object of airway tubes, Magill catheters and catheterization of the trachea is to overcome obstructions in the airway and establish natural breathing. Only experts can introduce a catheter either nasally or directly, but an airway tube can be used in an emergency by any one. Tubes are now an indispensable part of every anesthetist's kit, but the ordinary airway does not always work, as, in addition, the jaw may have to be held forward in order to give free breathing. The expanding airway tube allows natural breathing; that is, nasal as well as oral. After insertion, the blades are opened as one would manipulate a vaginal speculum, by turning a small screw,

Expanding airway tube.

the largest expansion being near the entrance of the trachea, thus making possible natural breathing (nasal and oral). Oxygen can now be easily introduced if the air is insufficient. Care must be taken not to remove the airway while it is expanded. The blades must always be collapsed before removing, to avoid traumatization. In addition to its use in anesthesia, it may possibly be used in diphtheria or other diseases, in gas poisoning, in drowning or whenever breathing is difficult.

Removal of saliva, blood or other foreign substances is made easier with the airway in place.'

133 East Fifty-Eighth Street.

Special Article

THE PATHOLOGY OF BERIBERI

E. B. VEDDER, M.D.
Colonel, Medical Corps, U. S. Army, Retired
WASHINGTON, D. C.

This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—ED.

Beriberi is a disease resulting from faulty metabolism and is directly caused by deficiency of the antineuritic vitamin B_1 and possibly other deficiencies in the diet. Among Orientals, this deficiency is usually produced by the too exclusive use of decorticated or polished rice; but it may equally be caused by the too exclusive use of white wheat flour and other carbohydrate staples. Clinically, beriberi is characterized by degenerative changes in the nervous system including a multiple peripheral neuritis, which may exist alone but is often combined with generalized edema and serous effusions, and by a tendency to the development of cardiac hypertrophy, which frequently results in cardiac failure and sudden death. In this definition vitamin B_1, as distinguished from other fractions of the vitamin B complex, is the compound isolated and synthesized by R. R. Williams, a compound of pyrimidine and thiazole which has been designated by Williams as thiamin.

As is evident from the foregoing definition, the pathology of beriberi may be discussed under three heads: cardiac pathology, degenerative changes in the nervous system, and anasarca. While much has been learned concerning the etiology of beriberi from animal experimentation, one should distinguish between the pathology of human beriberi and that of birds and animals.

THE PATHOLOGY OF HUMAN BERIBERI

Knowledge of human pathology is more limited than it should be after so many years of study, but it is significant. Death does not appear to be caused by neuritis, however extensive it may be, but by cardiac hypertrophy followed by sudden dilatation and cardiac failure. Accordingly, on postmortem examination the heart is found markedly dilated and hypertrophied especially on the right side, the chambers being filled with blood not very firmly clotted. The valves are normal, nor is there any obvious degeneration. Ellis [1] in 1898 in 125 necropsies of beriberi found the average weight of the heart to be 13.37 ounces (379 Gm.), the right side in nearly every case being much enlarged. During the same period 204 hearts from patients dying of other diseases averaged just under 9 ounces (255 Gm.). McLaughlin and Andrews [2] described finding the same conditions in infantile beriberi. "Probably the most striking and constant change is found in the right heart. Its musculature is coarse and firm and forms much the larger part of the organ, even in the contour of the apex. Its trabeculae and papillary muscles are prominent, while its cavity is enlarged. The wall of the right ventricle may measure from 5-7 millimeters in thickness while the left measures only 3-5 millimeters." The weight of the heart in Andrews' cases of infantile beriberi averaged 34.1 Gm. with a maximum of 54 Gm., while in death from other diseases the average heart weight was 20 Gm., with a maximum of 32 Gm. Later figures [3] are consistent. The average weight among Japanese beriberi patients has been given as 368 Gm., while the maximum of normal hearts is 300 Gm. The enlargement is most pronounced in the right chambers, and the left side of the heart may be very small. The right auricle is huge, with a paper thin wall through which the dark blood within may be seen.

As the result of the back pressure caused by the failure of the right side of the heart, pulmonary edema occurs in at least half of the cases, and chronic passive congestion of the liver, spleen, kidneys and intestine is constant. Punctate hemorrhages are often found subpleurally as well as in the stomach and duodenum, while the vessels in the walls of the stomach and intestine are dilated and hyperemic. The liver often has the typical nutmeg character, the spleen is perceptibly increased and hyperemic, and the kidneys are cyanotic. Microscopically, some degree of cloudy swelling or fatty degeneration may be found in the liver and kidneys in some cases. Fragmentation of the heart muscle has been described, but these changes are now generally believed to be merely post mortem. One of the obvious difficulties has been the rapid change occurring in the tropics, where most of these cases have been studied.

The cause of the hypertrophy and dilatation of the right side of the heart is not known. Formerly attributed to degeneration of the pneumogastric nerves, it is only necessary to state that this explanation does not account for the fact that the right side is usually solely affected, and there is apparently no correlation between the intensity of degeneration of these nerves and the cardiac disturbance. Wenckebach [4] explained the combination of cardiac hypertrophy and weakness by assuming that the hypertrophy was caused neither by an increased number of muscular fibers nor by a true increase in their size, but that this increase in size was caused by the imbibition of fluid. He pointed out that the electrocardiogram was normal and that when vitamin B extracts were administered the hypertrophy melted away "like ice in the sun." It is also true that cardiac hypertrophy is much more frequent in the "wet" than in the "dry" forms of beriberi. Unfortunately this explanation does not account for the peculiar selection of the right side of the heart for this action, nor has it been proved, which should be a simple matter. If the hypertrophy is caused simply by the imbibition of fluid by the muscle fibers, this could be shown by comparing the weight of this dried heart muscle with the dried weight of normal hearts. This has not been done for human cases. But Newcomb [5] examined pigeons' hearts. Of ninety-six pigeons fed on deficient diets, eighty-four developed polyneuritis columbarum, eight developed beriberi columbarum, which by definition included edema and enlarged hearts in addition to polyneuritis, and four died from other

From the Department of Experimental Medicine, George Washington University Medical School.

1. Ellis, W. G.: A Contribution to the Pathology of Beriberi, Lancet **2**: 958, 1898.
2. McLaughlin and Andrews: Studies on Infantile Mortality, Philippine J. Sc. **5**: 159, 1910.
3. Eddy, W. H., and Dalldorf, Gilbert: The Avitaminoses, Baltimore, Williams & Wilkins Company, 1937, p. 100.
4. Wenckebach, K. F.: Heart and Circulation in a Tropical Avitaminosis (Beriberi), Lancet **2**: 265 (Aug. 11) 1928. Alsmeer and Wenckebach: Herz und Kreislauf bei der Beriberi-Krankheit, Berlin, Urban & Schwarzenberg, 1929.
5. Newcomb, C.: Water Content of Heart Muscle in Beriberi Columbarum, Indian J. M. Res. **17**: 721 (Jan.) 1930.

causes. The heart muscle of all these birds was dried and weighed. Newcomb concluded that "The beriberi pigeons do not show a greater water content in their heart muscle than other pigeons fed on these diets. If a large heart in these birds is to be explained by water retention, they should, and quite definitely do not."

Until similar observations are made on the enlarged hearts in cases in man,[5a] the question cannot be regarded as settled; but the fact is that at present we are still at a loss to account for the concomitant right sided hypertrophy and weakness in beriberi.

NERVE DEGENERATION

The Spinal Cord.—The changes in the cord are not usually apparent grossly, but Bentley [6] reported nineteen necropsies and found the brain and its membranes congested, and the spinal cord congested and softened. "The lesions of the cord were so gross as not to require the use of the microscope to see them, for in some, only a few hours after death, the cord was soft and diffluent with hemorrhages, marked congestion and extensive edema quite sufficient in themselves to cause all the symptoms. My observations go to prove that it is a cord lesion which involves both sensory and motor functions of central origin, a subacute inflammation of the spinal cord and its membranes." While most observers have not found such gross changes or have attributed them to postmortem degeneration, there can be no doubt as to the microscopic changes, which have been reported by all observers. Degeneration of the medullary sheath has been demonstrated in scattered fibers in all tracts of the cord, but especially in the posterior columns as well as in both anterior and posterior nerve roots. In some cases the axis cylinder is fragmented. Degeneration of the medullary sheath is best demonstrated by the Marchi method, of the cells by Nissl or Giemsa stains. The axis cylinder is readily seen when degeneration of the medullary sheath is extensive but may be brought out more clearly by special stains, such as those of Golgi or Mallory. Wright [7] found changes in the posterior spinal ganglion and anterior horn cells, and in the nuclei of the medulla in cases in which the fibers originating from these cells were atrophied. That is, atrophy or loss of function in the axon leads to or is concomitant with disturbances in its trophic cell. The changes found in these cells depend in intensity on the length of time the polyneuritis has existed and include swollen and dislocated nuclei and loss of the Nissl bodies, which break down into a powdery mass. In more advanced degeneration this powdery mass almost disappears and there is vacuolation of the cell with rupture of its membrane and fragmentation of its processes. Similar changes have been found in the ganglion cells of the medulla and pons. These degenerative changes in most cases are not to be regarded as complete, which would mean the death of the cell, from which there could be no recovery; but they do indicate a very complete exhaustion of the affected cells.

The Peripheral Nerves.—Since the legs are first affected in beriberi, degeneration is most marked in the sciatic nerves and its branches, but some degree of degeneration may be found in any peripheral nerve. Degeneration of the myelin sheath is constant and affects the majority of the fibers, the myelin being broken up into balls or beads and eventually disappearing. When this occurs, the axis cylinders may show a coiled appearance and in certain cases are fragmented or atrophied. The more chronic and advanced the case, the more nerve cylinders are affected, but usually the majority appear normal even when the medullary sheath shows advanced degeneration. At the same time that such advanced changes are found in the nerves supplying the legs, the brachial nerves may show only a diffuse blackening of the myelin sheath with the Marchi stain. Similar degenerative changes have been found in the cranial nerves, particularly the phrenics and the vagi. It is especially to be noted that degeneration of the sympathetic system has been demonstrated, as in branches of the cardiac plexus, the splanchnic nerves and branches of the solar and renal plexuses.

The muscles supplied, particularly of the leg and thigh, are markedly atrophied, with loss of cross striation and shrinkage of the sarcoplasm, often combined with cloudy swelling or fatty degeneration. These changes are not characteristic of beriberi but may be found in the muscles in any variety of polyneuritis. In very advanced cases, the muscles of the arms or even of the trunk are similarly atrophied, and such muscles are exceedingly tender to the touch, causing the patient to flinch from the gentlest examination.

EDEMA AND SEROUS EFFUSIONS

Dry beriberi was described by Bontius in 1642 and edema and serous effusions were not described until 1808, and in 1812 Marshall described dry beriberi and wet beriberi as two separate diseases. In 1835 Malcolmson pointed out that cases commencing as wet beriberi became transformed into dry beriberi after a sudden diuresis, while edema often developed in dry cases. From this he concluded that dry and wet cases were but two types of the same disease. The proportion of wet cases will therefore vary in different outbreaks of the disease.

When edema occurs, it is noticed first in the legs and thighs, which often swell to such an extent as to make walking difficult. While often confined to these limbs it may become general, although the face is rarely affected. Edema of the lungs may be found in 50 per cent of the cases.

On making the postmortem incision in such cases, fluid blood exudes from the cut vessels, and serous fluid in the subcutaneous tissue is at once noticed. With regard to effusions, the pericardium is most frequently affected, followed by the pleura and the peritoneum. The effused fluid is clear and of a distinct greenish yellow.

In sixty-four cases in Java, pericardial fluid was found in sixty-two, hydrothorax in fourteen, and ascites in nine.

In 125 cases from the Malay States, hydrops of the pericardium was found in eighty-one, pulmonary edema in seventy-eight, hydrothorax in ten, and ascites in five. The amount of fluid in the pericardium varies from 50 to 500 cc.; in hydrothorax from 50 to 2,000 cc. The amount of fluid in the peritoneum is seldom large enough to cause much distention.

5a. Since this article was written, Weiss and Wilkins have contributed an article (Annals of Internal Medicine **11**: 104 [July] 1937), in which they state that in hearts of patients suffering from deficiency of the B complex, especially vitamin B_1, they found hydropic degeneration of the muscle and conductive fibers and increase in the intercellular substances, but unaltered water content.

6. Bentley, F. J.: Beriberi, Its Etiology, Symptoms, Treatment and Pathology, Edinburgh, Y. J. Pentland, 1893.

7. Wright, H.: Changes in the Neuronal Centers in Beriberic Neuritis, Brit. M. J. **1**: 1610, 1901; An Inquiry into the Etiology and Pathology of Beriberi, Studies from the Institute of Medical Research Federated Malay States, 1902.

PERCENTAGE OF WET CASES IN INFANTILE BERIBERI

Cases of dry beriberi in infants have been described, but they are relatively uncommon; in fact, McLaughlin and Andrews,[2] studying 219 infants dying under 1 year of age, showed that 124 of them died of a condition which they designated as moist beriberi. In later necropsies, Andrews [8] based his diagnosis on four points: (1) cardiac hypertrophy and dilatation, (2) congestion of the viscera, (3) anasarca and (4) absence of any other condition to account for death. All the cases of infantile beriberi identified by postmortem examination were therefore wet beriberi.

The cause of this general anasarca is not known. The fluid has the appearance and characteristics of simple transudates and has been attributed to degeneration of the sympathetic system and to the back pressure from the functional impairment of the right side of the heart, and more recently Eppinger [9] has considered the fluid to be the product of serous inflammation. Not one of these explanations is satisfactory. It was early noted that the edema was often dissipated after a sudden diuresis. This was probably due to a sudden change in diet because the edema in cases of ship beriberi also cleared up miraculously as soon as the sailors reached land and ate shore food. Again, Chamberlain and Vedder [10] found that the edema of infantile beriberi was dissipated by diuresis in two or three days as the result of administration of an extract of rice polishings that were primarily extracted with 95 per cent alcohol. This extract contained no protein and did contain large amounts of vitamin B_1. But this extract contained also many other nitrogenous bases. As the result of these considerations, I incline toward the hypothesis that the edema is caused by the deficiency of some as yet unidentified food constituent, possibly some fraction of the B complex aside from B_1, or some purine or other organic base.

BERIBERI IN BIRDS AND ANIMALS

Are the degenerative changes in the nervous system found in birds and rats fed on B_1 deficient diets due to beriberi or to inanition? Eijkman, who first discovered polyneuritis gallinarum, and most subsequent observers have considered the disease analogous to beriberi in man, but in recent years there has been a strong tendency to ascribe most of these pathologic changes to inanition caused by the failure of birds or animals to eat. It is well recognized that B_1 deficient diets cause an early failure of appetite. As early as 1911 Chamberlain, Bloombergh and Kilbourne [11] found that fowls starved to death developed a degeneration of the peripheral nerves not readily distinguished from the degeneration found in polyneuritis gallinarum induced by an exclusive rice diet. Quite recently, Davison and Stone [12] starved rats and, finding pathologic evidences of polyneuritis, concluded that "the pathological changes in the nervous system in animals suffering from inanition are essentially the same as in those deprived of vitamin B_1 or of both vitamins B_1 and B_2. If anything the changes in the peripheral nerves in animals subjected to inanition are more marked."

Kon and Drummond [13] attempted to separate the effects of inanition from deficiency in vitamin B by feeding four groups of pigeons. The pigeons in lot 1 received an artificial ration deficient in B. The birds in lot 2 were forced to eat the same quantity of food eaten by the birds in lot 1 plus 1 Gm. of yeast extract (marmite). The pigeons in lots 3 and 4 were forcibly fed with amounts of the deficient ration calculated to maintain weight. The pigeons in lot 4 received in addition 1 Gm. of yeast extract. The authors attributed the nerve changes to inanition, chiefly because the birds in lots 1, 2 and 3 lost weight rapidly. But the birds in lot 4, supposed to receive an adequate diet, also lost weight, and all these birds in lots 1 and 3 fed on the deficient diet were deprived of the entire B complex instead of only B_1.

It must be admitted that rats starved to death show definite degenerative changes in the nerves of the same general character as those found in polyneuritis. Nor are these degenerative changes eliminated when such starving animals are given adequate amounts of B_1. The degenerative changes are as a rule quite slight and consist of occasional minute droplets taking the black stain and according to my belief are not as extensive as the changes found in polyneuritis caused by feeding diets deficient in B_1.

Admitting that birds and rats fed adequate rations except for B_1 lose weight, and that starving rats given adequate amounts of B_1 show degenerative changes in their nerves, there is an excellent reason for not attributing these changes to inanition, for this is too simple an explanation, or, rather, it is an explanation that explains nothing. The nerve changes occurring in polyneuritis gallinarum are precisely similar to those occurring in human beriberi, and human patients are often well nourished and do not lose weight. Actually, one of the reasons often urged against dietary deficiency as the cause of human beriberi has been the fact that many patients maintain their weight and appear well nourished. Further studies on the physiologic action of B_1 may elucidate these difficulties.

Birds fed diets deficient in B_1 ordinarily develop only polyneuritis, comparable to dry beriberi in man. But McCarrison [14] succeeded in producing edema and enlarged hearts in a considerable number of pigeons, in addition to the polyneuritis, by feeding them on diets similar to those used by natives of India who develop beriberi. These diets included, in addition to rice, certain proportions of dal (a legume) and other antineuritic foods. McCarrison called such cases beriberi columbarum as distinguished from polyneuritis columbarum, the term applied to polyneuritis alone.

POLYNEURITIS GALLINARUM OR COLUMBARUM

The nerve lesions in such birds have been described by Vedder and Clark.[15] In sciatic nerves stained by the Marchi method, practically every fiber shows some evidence of degeneration, the extent of which varies greatly in the fibers of the same nerve. Some fibers show only a localized slight blackening, but the majority show more extensive change, frequent droplets of degenerating myelin. In from 10 to 15 per cent of the

8. Andrews, V. L.: Infantile Beriberi, Philippine J. Sc. **7**: 67, 1912.
9. Eppinger, Hans: Die Serosa Entzündung, Vienna, Julius Springer, 1935.
10. Chamberlain, W. P., and Vedder, E. B.: The Cure of Infantile Beriberi by the Administration of an Extract of Rice Polishings, Bull. Manila M. Soc. **4**: 26, 1912. Albert, Jose: Studies on Infantile Beriberi Based on Five Hundred and Fourteen Cases, Philippine J. Sc. **45**: 297 (June) 1931.
11. Chamberlain, W. P.; Bloombergh, H. D., and Kilbourne, E. D.: A Study of the Influence of Rice Diet and of Inanition on the Production of Multiple Neuritis in Fowls, Philippine J. Sc. **6**: 177, 1911.
12. Davison, Charles, and Stone, Leo: Lesions of the Nervous System of the Rat in Vitamin B Deficiency, Arch. Path. **23**: 207 (Feb.) 1937.
13. Kon, S. K., and Drummond, J. C.: Physiological Action of Vitamin B: Study of Vitamin B Deficiency in Pigeons, Biochem. J. **21**: 632, 1927.
14. McCarrison, Robertt: Beriberi Columbarum, India J. M. Res. Memoir 10, March 1928.
15. Vedder, E. B., and Clark, E.: A Study of Polyneuritis Gallinarum, Philippine J. Sc. **7**: 423 (Oct.) 1912.

fibers, there is in addition a swelling of the nerve sheath at these points and a disintegration of the axis cylinder, which is fragmented.

The Stages of Myelin Degeneration.—The earliest stage consists of slight swelling of the medullary sheath and a tendency toward segmentation at the circumference. Then follows the stage in which the largest globules distending the nerve are seen. Next is a stage in which the globules are much smaller though quite black and which only partly fill the sheath of Schwann. Then follows a stage in which the shrunken neurilemma contains only a few scattered droplets of fat.

The condition does not commence in peripheral branches and extend to the cord but appears to be as intense near the cord as in peripheral branches. Similar changes are found in the vagi in all cases as well as in the ventral and dorsal nerve roots but were much more advanced in the ventral roots.

The Spinal Cord: Degeneration was observed in the fiber tracts of all columns. Evidences of degenerated fibers were found in the thoracic region as well as in lower sections. The degenerative changes in the myelin sheath were the same as those described for the earlier changes in the nerves.

The Brain: Similar observations in Marchi preparations were made on the fiber tracts of the medulla, pons, midbrain and internal capsule, and degenerated fibers were found in each one of these brain divisions comparable to those found in the cord.

The Nerve Cells: Stained by the Nissl or Giemsa stains, changes are most marked in the cells of the lumbosacral region in both anterior and posterior horns of the cord. In these cells the stainable tigroid substance shows a marked tendency to break down into granular material diffused throughout the cell, or in later stages for the collection of this granular material at one side of the cell around the base of one of the processes. This granular appearance is suggestive of disintegration rather than solution of the tigroid substance. The cells of other parts of the gray matter of the cord do not show this change to such an extent, but they stain poorly and the cells have a pale appearance. In some instances the nuclei are dislocated or pale and poorly stained, suggesting degenerative change; but this was noted in very few cells. On the whole, the cells appear to indicate exhaustion rather than degeneration, and such changes have been brought about by fatigue. It appears therefore that, along with degeneration of the peripheral nerves and in the fiber tracts of the cord and brain, there occur changes in the nerve cells of the anterior and posterior horns of the spinal cord which may or may not signify actual degeneration, which probably does not occur until near the death of the fowl. Complete degeneration obviously cannot occur so long as recovery is possible. But it is recognized that in extreme cases of polyneuritis gallinarum recovery will not occur even after adequate administration of soluble B_1, and this may be due to actual degeneration of these nerve cells.

Comparing these changes with the changes in the nervous system already described as occurring in human beriberi, the great similarity of the two conditions is emphasized.

McCarrison [16] has described hypertrophy of the adrenal glands in polyneuritis of birds induced by B_1 deficient diets and an increased output of epinephrine. Several observers have confirmed this enlargement of the adrenals in birds, but Kon and Drummond [18] found no difference in the amount of epinephrine secreted by polyneuritic pigeons as compared with normal birds. This enlargement of the adrenals appears to be confined to birds, for according to my limited experience the adrenal glands are not enlarged in rats on B_1 deficient diets and, so far as I am aware, enlarged adrenals have not been mentioned either in animal experiments or in cases of human beriberi.

16. McCarrison, Robert: Studies in Deficiency Disease, Oxford Medical Publications, 1921.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

PHYSICAL THERAPY DEPARTMENTS IN HOSPITALS WITH FIFTY OR MORE BEDS

The increasing recognition of the value of physical therapy in conjunction with medicine and surgery has led to a growing demand for information on suitable plans for departments of physical therapy. The following outline of minimum requirements for such departments is suggested with this in view.

Each hospital has certain problems common to all as well as its own individual ones. In any given instance, the type of hospital, the types of cases treated, the number of nonpaying as compared to paying patients, and, most important of all, the attitude of the general staff toward physical therapy will determine the size of the department. If the staff members are not aware of the good results that may be obtained through the use of physical therapeutic measures, such as the important shortening of convalescent periods and the more complete restoration of function to injured joints, muscles, tendons and nerves, they will not refer cases to the department which may profit by these treatments but will use it as a dumping ground for patients with chronic disabilities.

Any therapeutic measure to be effective must be prescribed with a definite objective in view. Ill advised prescription of physical therapeutic agents by the director of the department will discourage both the patients and the referring physicians. Their consequent loss of confidence will be reflected in the general attitude toward the department. Since the success and growth of the department depend on satisfying these two parties, it is most essential that the staff be alive to the possibilities inherent in physical therapy so that its intelligent cooperation will be assured. Without this, the department will not become an integral part of the institution.

Once the cooperation of the staff has been secured, the next step in planning the department lies in considering the chief function for which the hospital was planned, since this will determine the types of cases to be treated. Hospitals that specialize need equipment particularly adapted to themselves; for example, institutions for mental and nervous cases utilize hydrotherapy extensively, while hospitals for tuberculous and pediatric cases may concentrate on ultraviolet therapy. In general hospitals, especially those serving a high percentage of orthopedic and traumatic cases, there is the greatest need for well trained technicians able to give massage, muscle training and other types of exercise. A limited amount of apparatus is needed for heat therapy, hydrotherapy (principally pools for underwater exercise), occupational therapy and muscle reeducation exercises.

To determine further requirements for any particular hospital, its statistics should be studied to find the predominant types of cases treated, the daily average of bed patients who may need physical therapy, the possible number of outpatients and the financial outlay which the hospital is prepared to make. Given time, a properly managed department will become a decided asset but, as in any undertaking, this must be shown to the management to be believed. A moderate investment will be enough to start with. Later the department may be built up as its importance is felt. From statistics gathered

as aforementioned, an estimate may be made of the probable number of treatments to be given and types of cases that will be most frequently encountered and benefited.

With these figures in hand, the next move will be to choose the right personnel. All the ingenuity and planning that go into creating the mechanical set-up will be wasted without a properly trained director in control. This physician, in addition to ground work in medicine and surgery, should have taken a postgraduate course in physical therapy. Although apparatus-therapy is only a small part of physical therapy, it will be necessary for the director to understand the physical principles involved in the construction of the various devices as well as the clinical application of these different units. Such a background will enable him to prescribe physical measures effectively.

Smaller hospitals may not require the services of such a director. If a roentgenologist who has had some training in physical therapy is available, the physical therapy department may be combined with his. Where a man with this type of training is not available, obviously some member of the staff must acquire sufficient knowledge of physical therapy to supervise the department.

Larger hospitals can afford to employ a part-time director who divides his time between several institutions. In the largest hospitals the director may have to spend his entire time in the department directing or administering treatments and in examining the patients at frequent intervals to make certain they are gaining ground. If and when no progress is being made, this first-hand knowledge serves as a check to prevent clogging the channels with "treatment habit" patients.

Quite often the referring physician will prescribe his own treatments. This does not minimize the responsibility of the director of the department. If after examining the patient, he feels that the prescribed therapeutic measures are not indicated, he is at liberty to discuss this with the referring physician and suggest treatment which he feels is applicable.

The guiding hand of the director will count for nothing without the proper technical personnel. Choice of the right technician will ensure correct application of the prescribed treatments. The head technician of a department should be a graduate of an approved school for physical therapy technicians and be registered with the American Registry for Physical Therapy Technicians. The Council on Medical Education and Hospitals of the American Medical Association has published a list of approved schools of this type.[1] As prerequisite for admission to these schools the candidate has had to satisfy one of the following requirements:

(*a*) Two years of sixty semester hours of college, including courses in physics and biology.

(*b*) Graduation from an accredited school of nursing.

(*c*) Graduation from an accredited school of physical education.

The training itself consists of at least 1,200 hours of theory and practice, including 210 hours of applied anatomy. A technician with this training, although completely unequipped to diagnose cases, has gained sufficient knowledge of anatomy, physiology and pathology to understand the theory underlying the prescribed treatment. Such background cannot be acquired in one-week courses in which a nurse is shown how to operate a few electrical machines. Nor can the run-of-the-mill masseur give adequate physical treatments. The number of treatments which one technician can give in a day will depend on the type of cases treated. On an average, adequate treatment cannot be given to more than from sixteen to twenty patients a day. If the aforementioned type of personnel is not available to the hospital, considerations for starting a physical therapy department may as well be dropped until such personnel is available.

When the cooperation of the staff is assured and the proper personnel is at hand, it is time to decide on a location for the department. Unfortunately, the ideal arrangement of rooms cannot be added to old hospitals in which all available space is probably utilized. Consequently, many departments have been placed in basements. It seems timely to advise against this.

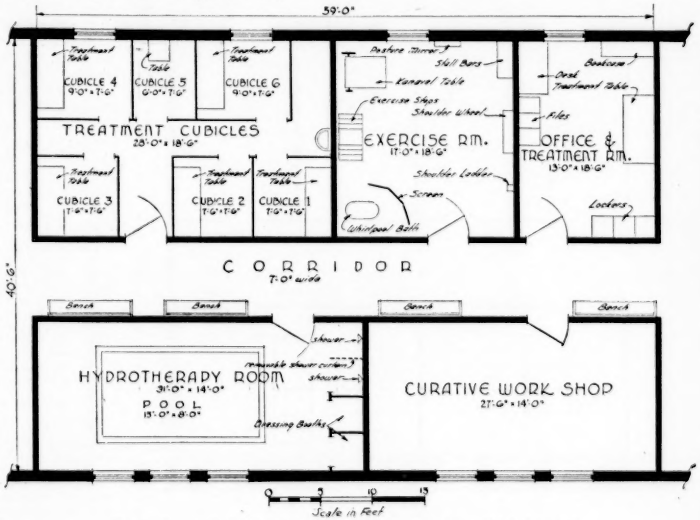


Fig. 1.—Suggested plan for a physical therapy department in a 250 bed hospital.

The best location is on the first or ground floor. This will enable outpatients to receive treatment without going through the hospital corridors. Many of these outpatients are crippled and unable to ascend stairs. It is particularly important to have the rooms well ventilated and well lighted, because fresh air is vital where exercises are to be given.

Temperature in the rooms is apt to be higher than outside owing to the presence of heat-producing machines. Consequently the patient may not be even moderately comfortable unless there is cross-ventilation. In still air, excess heat is dissipated by the patient chiefly in the form of perspiration and very inefficiently in that form. Stagnant air next to the body becomes saturated and then perspiration does not evaporate until this layer moves off by diffusion. With moderate air motion, on the other hand, the patient will maintain his temperature equilibrium by the loss of heat through evaporation, convection and radiation. Air motion lowers the humidity in the room, thus increasing the patient's comfort.

Other considerations determining the location of the department follow. Proximity to elevators is essential since it is more convenient to bring patients to the department than to treat them in their rooms. Also it is easier for the technician to take apparatus to the patient's room or surgical floor when necessary. The relationship to the various clinics and the

1. THE JOURNAL, Aug. 29, 1936.

x-ray department is important. Availability of water supply, sewers, toilets, electric outlets and floor exits must also be taken into account.

If a new department is to be built, the architect should consult with the director when making plans. The two main types of departments are as follows: (1) a single large room; (2) separate rooms for each therapeutic measure. Innumerable variations lie between.

A large treatment room may be used in general hospitals or in a large free clinic. Here a certain amount of privacy is achieved by dividing the large room into a number of cubicles, either by means of sheets suspended from a 7 foot level or by steel, marble, beaver-board or other types of partitions. See treatment cubicle room on hospital plan (fig. 1), in which this has been done successfully. The cubicles should measure at least 6 by 8 feet. Larger ones are preferable. If private patients are to be treated in general hospitals, several adjoining rooms may be utilized for heat therapy and massage, for hydrotherapy, for muscle reeducation exercises, for ultraviolet

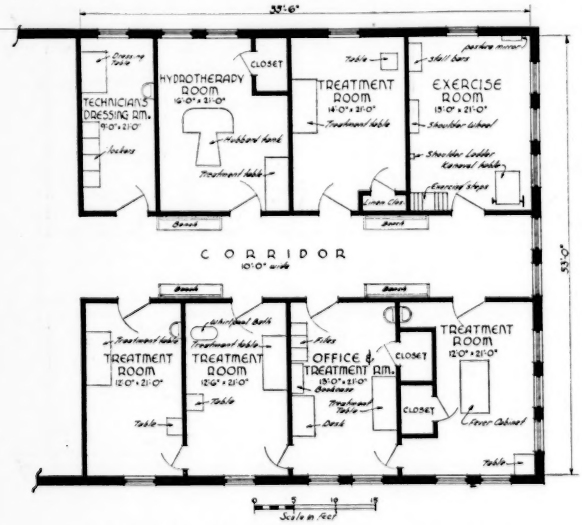


Fig. 2.—Suggested plan for a physical therapy department in a 300 bed hospital.

treatments and for applications of high frequency currents (fig. 2). In a 300 bed hospital with a department, such as seen in figure 2, many private patients receive treatments in their own rooms. In such cases the department proper does not have to be as large as that in a general hospital treating a preponderance of clinic patients.

Linoleum or some rubber composition makes a soft floor covering. The technician is on her feet all day. Consequently her efficiency is decidedly lowered by foot ailments. A hydrotherapy department needs tile or concrete floors. There may be a pool in this department for underwater exercises. Owing to the weight of the pool, this section must be placed on the ground or basement floor regardless of the location of the rest of the physical therapy department.

The plans for the wiring and placing of apparatus should be drawn with a view to the future, rather than the immediate, needs of the department. It is far less expensive to have too many outlets in the beginning than to tear up the walls for rewiring later. The plugs connecting the machines to the wall receptacles should be designed to fit only one outlet so that no mistakes, such as blown fuses, will result. Polarity plugs may be used with direct current apparatus to advantage. The outlet plugs should be placed from 3 to 4 feet from the floor level so that they may be reached without stooping. This also facilitates the movement of apparatus.

Mock stated that 90 per cent of physical therapy in general hospitals consists of common sense and intelligent handwork. Elaborate apparatus and machine therapy do not make a physical therapy department. The director is advised to keep this truism in mind when outfitting a department. The physician in charge of the department must have a clear idea of the elementary physiologic reactions of the body to heat, light, water, electric current and exercise so that he may prescribe a particular measure for a given purpose.

Probably there will be relatively few patients needing physical therapy in the fifty bed hospital. If one of the staff physicians or the roentgenologist is trained to direct the use of physical measures, it may be possible to obtain a technician for part time service. A room approximately 24 by 30 feet may be set aside for this department. Partitions of wall board or other light material form the main walls of treatment cubicles. Curtains may be used for the front wall. Desk and other equipment is then conveniently located in the remaining space (fig. 3). It may not be possible to set a room aside for this department. If such is the case, only the simplest measures should be prescribed, preferably those which may be carried out in the patient's room.

Minimum requirements in equipment will consist of apparatus which can be made by the hospital carpenter and electrician, it being kept in mind that heat can be administered with wide success without much apparatus. The units decided on should be readily movable; i. e., on casters, or portable:

Two home-made bakers:[2] one for local applications (14½ inches high by 17 inches long by 14 inches wide, containing approximately four 60 watt bulbs); one for body applications (24 inches high by 30 inches long by 22 inches wide, containing approximately eight 60 watt bulbs).

One paraffin bath: 1¼ gallon double boiler; electric or gas stove; 8 pounds of paraffin.

One tank for underwater exercise.

Exercise apparatus (see fourth following paragraph for list and choose simpler ones at first).

If funds are available, the two following lamps may be used in place of bakers:

Tungsten 1,000 watt lamp (for "near infra-red," where deeper penetration over large body area is desired—from 10 to 30 mm., according to Coblentz).

Small, nonluminous infra-red lamp (for "far infra-red" applications to local areas, more superficial absorption—from 3 to 0.1 mm., according to Coblentz).

Other physical measures, such as massage, exercises, hot compresses and cold packs, may be supplied by the technician. If circumstances warrant, and only when warranted, the following equipment may be added:

One portable diathermy unit for medical and surgical use.
One ultraviolet mercury arc lamp.
One galvanic-sinusoidal outfit.

Hospitals with beds for 100 or more patients will probably need departments set aside for physical therapy (fig. 1). It is impossible to set arbitrary limits to the amount of equipment which a given hospital should require, since each has its own particular set-up. In any case the equipment should be purchased from a reliable manufacturer so that the servicing and replacement of parts will be assured. One of the functions of the Council on Physical Therapy of the American Medical Association is to set standards for acceptable devices and methods used in this field. It furnishes a list of accepted apparatus containing the names of manufacturers who have attempted to construct efficient and reliable equipment for the medical profession.

2. Directions for making bakers may be secured from the Secretary of the Council on Physical Therapy, 535 North Dearborn Street, Chicago.

V 1
193

The following will give a rough idea of the appliances usually considered essential in the smaller departments in general hospitals of more than 100 beds:

Four tables (33 inches high by 78 inches long by 30 inches wide) can be made by the hospital carpenter. A shelf about 1 foot from the floor should be added to table for cold cream, powder and clothing. Tops of tables should be well padded and covered with nonconductive material.
One 1,000 watt tungsten lamp.
One or more small, luminous or nonluminous infra-red lamps.
One diathermy machine for medical and surgical use.
One low frequency machine arranged for galvanic[3] and sinusoidal currents.
One ultraviolet generator (mercury vapor, carbon arc or mercury glow).
One whirlpool bath.[3]
Apparatus for exercising various joints: shoulder wheel,[3] exercise steps,[3] shoulder abduction ladder, Kanavel table,[3] overhead sling and pulley for bed exercises, adjustable stall bars[3] and posture mirror.

In addition, if there are many neurologic cases to be treated, it is important to have a faradic coil to aid in muscle and nerve tests.[3] A Hubbard tank[3] is utilized for giving underwater exercises to children with infantile paralysis, congenital dislocation of the hip, tendon transplants and similar conditions in which it is important to restore muscle function without putting too great a strain on weak muscles. With the foregoing equipment, one technician can treat from sixteen to twenty patients a day. In the larger general hospital it will be useful to have a larger personnel and more complete equipment, including additional units of the foregoing types. Naturally this depends on the particular hospital but the list is a tentative suggestion.

Interference with communication by the stray energy radiated through space by diathermy, x-ray and other electrical apparatus has been decreed a nuisance in some localities. If a new building is being erected to house the department, it might be advisable to screen the treatment rooms or even the entire department by suitable conducting material, well grounded. Even when a section of an established hospital is turned over to the physical therapy department, conditions may warrant the screening of the room in which equipment is used. In many instances the good will of the local radio user, thus gained, will more than pay for the additional outlay of expense.

Hydrotherapy equipment is used more frequently in institutions for nervous and mental diseases than in general hospitals. These institutions find this a most important physical measure in treating psychoses and psychoneuroses. Equipment of the following nature is used:

Continuous (tub) baths.
Douches and sprays (providing hot and cold water in jet or spray form).
Showers, cabinet and overhead variety.
Sitz baths.
Tables, rubber sheets, blankets (for giving wet packs).

Elaborate hydrotherapy equipment is seldom successful in general hospitals. In smaller hospitals one hydrotherapy room may be utilized for all forms of treatments. If more room is available two rooms are advisable, one for men and one for women.

The most important equipment for a general hospital concentrating in orthopedic work is one of three types of tanks designed for underwater exercises: (1) A large pool where the technician may work in water with the patient; (2) a pool from 3½ to 4½ feet deep, 8 by 15 feet in external dimensions, where the patient may walk while the technician follows around outside the pool, and (3) a Hubbard tank, where the patient can exercise only in a recumbent position. General hospitals dealing with a preponderance of traumatic cases will concentrate on equipment such as the following:

Bakers and infra-red or luminous heaters.
High frequency units.
Whirlpool baths (one for arm and one for leg cases).
Faradic and galvanic apparatus.
Exercise apparatus for muscle reeducation: (A complete set will include types of appliances for exercising each joint of the body, so that graded exercises can be given for any part.)
Equipment for an occupational therapy (curative) workshop.

If fever treatments are to be given, ample space should be set aside. This is needed for special equipment such as the heating unit and cabinet or other devices used for elevating and maintaining temperatures, an electrical thermometer, oxygen and carbon dioxide tanks, basins, extra blankets, towels, dry sheets, and a table. In addition, it is important that there be room enough for the technician to get around quickly in case of an emergency requiring rapid removal of the patient from the heat-maintaining equipment. To reduce the humidity in the room, good ventilation is essential. The Council on Physical Therapy has adopted specifications for fever apparatus and these should be consulted before acquiring equipment.

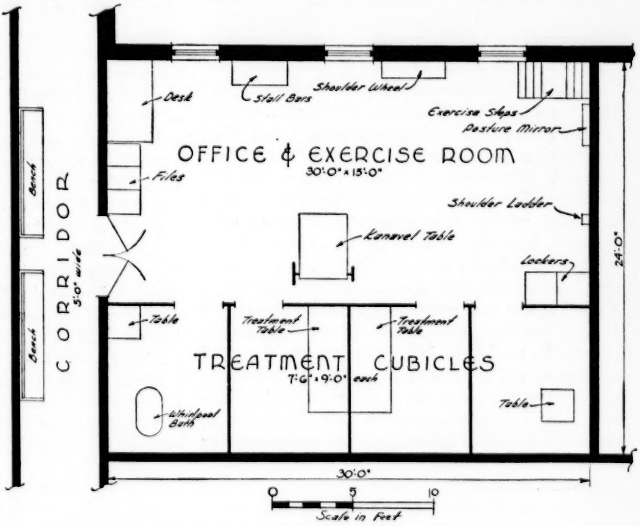


Fig. 3.—Suggested plan for a physical therapy department in a fifty bed hospital.

A final but a most essential consideration lies in keeping records of the cases treated. Without a carefully worked out recording system, the department cannot cooperate with the other divisions of the hospital. Records indicate the value of the treatment both to the patient and to the staff. They enable the director to keep the stream of patients moving, weeding out those who show no improvement. At the same time they point to the progress and growth or stagnation of the department itself.

In conclusion, it is emphasized that 90 per cent of the physical therapy in a general hospital can be done with the simplest physical agents: heat, massage and exercise. The most important factors in a hospital physical therapy department are competent medical direction and efficient physical therapy technicians.[4]

3. Directions for making these units may be secured from the Secretary of the Council on Physical Therapy, 535 North Dearborn Street, Chicago.

4. Additional references:
To 1932: Coulter, J. S.: Principles and Practice of Physical Therapy, Hagerstown, W. E. Prior Company, 1934, vol. 3, pp. 1-48.
To 1937: Krusen, F. H.: Physical Therapy in the Hospital, Hospitals **11**: 54 (Aug.) 1937.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Seven dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, MARCH 19, 1938

RECENT RESEARCH ON HEARING

With the cathode ray oscillograph, Wever and Bray [1] studied electrical changes in the auditory nerve of an anesthetized animal in response to sound. They discovered a phenomenon previously unknown, "the electrical response of the cochlea." The term connotes a change of electrical potential in the cochlea which occurs 0.1 millisecond after sound is incident on the eardrum. According to Kerridge,[2] the change varies in direction as often as does the pressure of air on the drum. As electrical changes are converted into sound waves in every radio set, a similar method was applied to the electrical response of the cochlea. Thus sounds of the voice or of music in the same room as the ear of an anesthetized cat can be relayed to another room, where phonograph records of the reproduced sounds can be made. Although an entirely different phenomenon, the action potentials of the auditory nerve may also contribute to the registrations of the recording instrument.

When exposed to tones sufficiently loud to make them deaf to the tones, dogs were found to lose the electrical cochlear response to the tones. The electrical response for high tones is more readily picked up from the base of the cochlea than it is from the apex, while the reverse is true for low tones. When the basilar membrane or the round window is punctured the response disappears, a result which would suggest that the electrical response is dependent on the basilar membrane.

The significance of the electrical response of the cochlea is unknown. The fact that it begins 0.1 millisecond after the stimulating sound has reached the ear, while the action potential in the auditory nerve does not start until after 0.6 millisecond, may indicate some process which causes the stimulation of the auditory nerve fibers. At any rate the sound reaches the cochlea at least half a millisecond before the auditory nerve response.

By the elimination of the electrical cochlear response, many characteristics of the action potentials of the auditory nerve have been discovered. The electrical changes recorded from the nerve seem to bear no relation to the frequency of the stimulating sound when this exceeds 3,000 vibrations a second. Below this pitch, however, there is one change of potential for every sound vibration impinging on the ear up to 1,000 per second, one change for every second vibration up to 2,000 per second, and one for every third vibration up to 3,000 per second. This observation raises the question whether the mechanism of hearing is different for tones in the lower and higher parts of the auditory range. It may be that the brain recognizes the higher tones by the particular nerve fiber that was excited, and the lower tones by the rate at which impulses arrived or because of both.

Lorente de No [3] has demonstrated that the radial nerve fibers in the cochlea supply only the internal hair cells. The internal spiral fibers run to both internal and external hair cells. The external spiral fibers serve the external hair cells. A single ganglion cell will connect with a large number of external hair cells for a third of a cochleal turn or more. Such distribution of nerve fibers to the hair cells suggests that there is a difference of function between the inner and the outer hair cells, the former being the discriminators of pitch, the latter agents to detect weak sounds. The external hair cells are placed so as to be more free to vibrate than the inner hair cells. Lorente de No found that many of the external hair cells were degenerated in the ear of an animal which had been exposed to a loud note of constant pitch.

This mechanism for discriminating the pitch would explain the fact that man can differentiate smaller differences in pitch if the sounds are moderately loud than if they can only just be heard. There is anatomic evidence to explain the great acuity of hearing in the middle pitches; the spiral ganglion cells corresponding to the central region of the cochlea are much more numerous than others, and the part of the central ganglion in the medulla connected with the fibers of the central region of the cochlea is bigger than the parts which are connected with the apex or the base.

About eighty years ago, Helmholz provided mathematical evidence to the resonance theory of hearing. While this theory has been modified, as Kerridge points out in her review, there has been no alternative theory which has been backed by sufficient evidence or which accounted for the existence of the cochlea. A clearer understanding of the mechanism of hearing may come about as a result of the newer electrical methods of research.

1. Wever, E. G., and Bray, C. W.: Action Currents in the Auditory Nerve in Response to Acoustical Stimulation, Proc. Nat. Acad. Sc. **16**: 344, 1930; The Nature of Acoustic Response: The Relation Between Sound Frequency and Frequency of Impulses in the Auditory Nerve, J. Exper. Psychol. **13**: 373, 1930.

2. Kerridge, Phyllis M. Tookey: Recent Advances in Knowledge Concerning Hearing and Speech, Physiol. Rev. **18**: 59 (Jan.) 1938.

3. Lorente de No, R.: Anatomy of the Eighth Nerve, Laryngoscope **43**: 1 (Jan.) 1933.

NEBRASKA PHYSICIANS LEAD FIGHT ON TUBERCULOSIS

The medical profession, in the pioneer days of the public health movement in the United States, was responsible for the establishment and early development of many activities. State departments of health and many of the voluntary health movements are conspicuous examples. The interest of the medical profession in the public health has never waned. Its constant fight against quackery within and without the profession, the work of its educational and scientific councils, its radio broadcasts, and other activities bearing on better medical education and better medical care are efforts in behalf of the public health. A timely example is found in recent developments in the state of Nebraska, where the state medical association is in the vanguard of the fight against tuberculosis.

Nebraska is among those states with a tuberculosis death rate under 40 per hundred thousand of population. Therefore the tuberculosis problem in Nebraska differs from that in more populous states with higher death rates. The latter can now aim only at control, while Nebraska can aim at eradication. Early in 1936, when the state board of control began planning for a long term program for the state tuberculosis hospital, advice was asked of the state medical association, the state tuberculosis society, the state department of health and the state planning board. A survey of the tuberculosis situation in Nebraska was decided on, "to obtain information which would assist the Board of Control and the State Planning Board in judging the tuberculosis problem in the state and planning for hospitalization requirements; second, to make a real case-finding survey of the state with ultimate purpose of controlling the disease." The sources used were death records of the state health department, state hospital cases and cases reported to the state health department. These sources were supplemented by questionnaires to all practicing physicians and to hospitals. Returns were made to the executive office of the state medical association, and only the statistical material was released to the state planning board. "According to the plan of making a complete case-finding survey, it was decided to make an intensive survey of one county. York County was chosen because it was the first suitable county to furnish complete information." [1]

Organizations furnishing either funds or personnel or both included the planning board, the state medical association, the tuberculosis association and the York County Medical Society. Volunteer graduate nurses assisted and high school pupils acted as clinic clerks. In York County a program of case finding was inaugurated according to standard correct methods. Tuberculin tests (3,707) were done and the positive reactors (683) were advised to have x-ray examination. A gratifyingly large percentage (634 persons) did so. The population of York County is 17,239; hence roughly 20 per cent of the population, mostly at high school age, was tested. Four new and hitherto unknown cases of tuberculosis were uncovered, bringing the total known cases for York County to thirty-six, or 90 per cent of the theoretical total cases existing there, a very high percentage. Thus the first step toward the conquest of tuberculosis has been taken in York County, by the acquisition of highly accurate knowledge of existing foci of the disease. A sound basis for intensive and economical control and eradication is established in this area. York County celebrated by organizing a county tuberculosis association, the first in the state. In addition to state and local medical society and tuberculosis association officials, the American Medical Association and the National Tuberculosis Association were represented at the organization meeting and the public meeting that followed.[2]

This movement is significant because of its cooperative character, its medical participation and leadership, its demonstration that small rural communities can function effectively for public health with appropriate aid, and its great success in achieving its primary objective. The first step has been taken in a statewide plan for the eradication of tuberculosis in Nebraska.

1. Tuberculosis Survey of York County, Bureau of Health and Public Instruction files.

2. Addresses were given at these meetings by Philip P. Jacobs, Ph.D., of the National Tuberculosis Association and W. W. Bauer, M.D. of the American Medical Association.

BENZEDRINE SULFATE—A WARNING

Following the appearance of items in the press during the last few weeks, many inquiries have been received concerning the use of benzedrine sulfate in the treatment of obesity. Sensational reports on the effects of benzedrine sulfate are not new to the medical press or to the daily newspapers. Some months ago THE JOURNAL published a critical editorial on benzedrine sulfate.[1] At that time the drug was being used unwisely to avoid fatigue; news that it could be obtained for keeping one awake while "cramming" for final examinations spread from campus to campus. The drug has been employed for such widely variable conditions as anginal pain, seasickness and apathy. Now it is suggested for weight reduction. While not as toxic as the ill famed reducing agent dinitrophenol,[2] nevertheless its use may be followed by serious consequences. Just as the Council on Pharmacy and Chemistry issued a report on the status of dinitrophenol, it has recently published a report on benzedrine sulfate.[3] The Council concluded that in the light of available evidence claims for benzedrine sulfate should be limited to its usefulness in narcolepsy, postencephalitic parkinsonism and certain depressive mental states encoun-

1. Benzedrine Sulfate "Pep Pills," editorial, J. A. M. A. **108**: 1973 (June 5) 1937.

2. Dinitrophenol Not Acceptable for N. N. R., Report of the Council on Pharmacy and Chemistry, J. A. M. A. **105**: 31 (July 6) 1935. Dangers of Slimming, Current Comment, ibid. **105**: 804 (Sept. 7) 1935.

3. The Present Status of Benzedrine Sulfate, Report of the Council on Pharmacy and Chemistry, J. A. M. A. **109**: 2064 (Dec. 18) 1937.

tered in institutionalized patients. In this report it was noted that Nathanson had described a loss of appetite following the use of the drug for the avoidance of fatigue; hence it seemed to be potentially a drug which would be somewhat effective in obesity.

The recent publicity is based on the latest report by Myerson and his associates [4] in the Division of Psychiatric Research at the Boston State Hospital. The use of the drug in obesity is advocated on the premise that in many cases this condition is associated with anhedonia (defined by Myerson as "a diminution, even to the point of disappearance, of satisfactions normally obtained from life activities, and in loss or distortion of appetites and desires"). Myerson believes that these patients have a tendency to eat too much and too often, to nibble between meals not only in an attempt to satisfy the appetite but to escape from their neurosis. Proceeding on this basis, Myerson and his associates employed a 1,400 calory diet and gave the patients benzedrine sulfate for the purpose of making them satisfied with this caloric intake; reductions were reported, averaging a pound a week. Myerson's work with this drug has been extensive, yielding much clinical evidence concerning its effects. It must be remembered that, when Myerson recommends the drug for certain purposes, he frequently refers to its use in conditions as they occur in patients coming under the purview of the psychiatrist and neurologist. It does not necessarily follow that such results may be safely or effectively produced in otherwise normal persons. The Council in recognizing the usefulness of benzedrine sulfate in the treatment of narcolepsy decries its use for sleepiness and fatigue in those who are otherwise normal. Many of Myerson's cases concerned definitely psychoneurotic patients classed as suffering from anhedonia. He treated the obesity by reducing the caloric intake, and the anhedonia by administering benzedrine sulfate. It may be assumed, therefore, that the drug might fail to reduce weight effectively in the normal person who does not suffer from anhedonia.

Myerson's report gave the details of eight of a total of seventeen cases. The diagnosis of three of these was "obesity with psychoneurosis." Other diagnoses were "obesity with hypermenorrhea," "obesity following subtotal thyroidectomy," "obesity—failure of benzedrine to aid in reducing weight" and just plain "obesity."

Benzedrine sulfate is contraindicated in many conditions, especially in cardiac conditions, which are not infrequently seen in the obese. Finally, evidence is accumulating which indicates that its use may produce craving and even addiction in some instances.

Both THE JOURNAL and the Council have previously noted that this drug is too new to pharmacology and experimental medicine to warrant any prediction as to the possible harm that may result from its long continued use. Even if benzedrine sulfate could be safely and effectively used to reduce weight there is no evidence that it will have any permanent effect on weight. Its use over long periods is certainly not without danger, particularly to the circulatory system. Physicians may well warn patients against the indiscriminate use of the preparation to control obesity. Benzedrine and its sulfate are promising drugs when used properly.

4. Myerson, Abraham, and Lesses, M. F.: Human Autonomic Pharmacology: XVI. Benzedrine Sulfate as an Aid in the Treatment of Obesity, New England J. Med. **218**: 119 (Jan. 20) 1938.

Current Comment

MEDICAL ACTIVITIES AT BOY SCOUT JAMBOREE

Last summer, in celebration of the founding of the Boy Scouts of America, Washington, D. C., was host to some 25,000 boys from June 30 to July 9. The medical aspects of the occasion have been reviewed by Smith.[1] The camp sites chosen were probably the best obtainable, but it was unfortunately necessary to scatter them in groups over a considerable area. Some of the camp sites were low, and heavy rains preceding the jamboree caused apprehension from a sanitary point of view. The camp was divided into twenty sections with approximately 1,250 boys each, and each constituted a separate administrative unit. The Health and Safety Department had three divisions: sanitation, safety and medical. The division of sanitation included sanitary engineers, sanitary inspectors and food inspectors. The division of safety was in charge of fire prevention and protection, promulgated accident and safety measures and investigated each accident. The medical division consisted of the chief medical officer, assistant chief medical officer, a part-time medical officer for emergencies, a chief medical inspector, a controller of medical supplies, two ambulance drivers, one secretary, one chauffeur, one dispatch rider and two orderlies. Each unit had a tent first aid station. Among the supplies to each unit was a quart of castor oil. But at the end of the jamboree the twenty quarts were returned intact! Epsom salt also was unpopular. The first aid stations were each manned by three physicians and four orderlies. This personnel was volunteer and came from all sections of the United States. The stations were connected with headquarters by telephone. The facilities of the naval hospital for noncontagious diseases were offered by Admiral Rossiter, and all cases of contagious nature were cared for at the Gallinger Hospital. When a scout applied for admission to the camp he was required to give a medical history and undergo a physical examination at home. Any scouts showing physical difficulties which might be expected to interfere with camp activities were rejected. In spite of this precaution, boys arrived in camp with diabetes, asthma, tuberculosis, mental conditions and also a history of recent exposure to mumps. Perhaps the errors reflected an oversympathetic attitude on the part of the examining physicians at home, but the result, as Smith points out, suggests the

1. Smith, W. L.: Medical Activities at the Boy Scout Jamboree Held in Washington, D. C., June 30-July 9, 1937, Pub. Health. Rep. **52**: 1854 (Dec. 17) 1937.

advisability of having future examinations made by a physician familiar with camp activities. The average daily attendance at all first aid stations was approximately 970, 78 per cent of the calls being for surgical and 22 per cent for medical treatment. The predominance of surgical conditions was due largely to the minor injuries treated, a large number of which were cuts with a scout ax. Colds were common in the first part of the camp period, and during a hot spell several sections reported simultaneously a slight elevation of temperature associated with severe vomiting in a number of their boys. The attacks were of short duration and no sanitary cause was found. One snake bite was treated, which occurred in a scout who handled snakes as an exhibit. One boy was given antirabic treatment. Only one injury from fireworks was reported, a burn of the thumb. During the two weeks, including three days before camp formally opened and one day after it closed, there were 143 admissions to the hospital. Fifteen boys were admitted to the Gallinger Hospital, ten for mumps, three for scarlet fever, one for measles and one for observation for meningitis, which proved to be only a gastro-intestinal upset. Among those sent to the Naval Hospital two were injured in traffic accidents, and there were ten fractures, nine sprains, four lacerated wounds and twelve cases of infection and cellulitis. One boy came to the jamboree with boils on his arm, acquired a staphylococcic infection of the blood stream and died about two weeks after the jamboree was over. Twenty were sent to the hospital for conditions diagnosed as appendicitis but only three were operated on. The experiences obtained will doubtless be of value on future occasions, both for this organization and for others.

110
938

POTENCY OF LIVER PRODUCTS

Since liver and its preparations were first introduced in therapeutics for the treatment of pernicious anemia, there has been difficulty in determining the potency of the products. The Council on Pharmacy and Chemistry a few years ago evolved a means of expression that gave the physician some measure of the potency of the product. Many hospitals and institutions using liver preparations now limit their purchases to the products accepted by the Council. The standardization of antianemic preparations of stomach has been placed in the hands of the U. S. Pharmacopeia Anti-Anemia Preparations Advisory Board.[1] As there is no satisfactory laboratory method which may be used for this purpose, it has been necessary to check the potency of these remedies by administering them to patients with pernicious anemia. Obviously this method possesses certain disadvantages, chief of which perhaps is the scarcity of suitably untreated patients. The Committee of Revision of the Pharmacopeia provided for an advisory board to pass on clinical data which manufacturers of these products might present, and if the data indicated a satisfactory degree of potency, the board would approve the product and it could be labeled under the U. S. P. title. The important feature to both physician and patient in this program is that it is designed to insure a product of reasonably uniform potency. Under the rules of the board the amount of liver supposed to be represented in the product may not be mentioned on the label, as it is likely to be misleading; a product derived from 100 Gm. of liver is not necessarily twice as potent as one made from 50 Gm. Products will now be labeled in units, and patients should receive for a maintenance dosage an average of about a unit each day. From now on the U. S. P. label on liver and stomach products will indicate that the product has been assayed for a satisfactory degree of hematopoietic potency. In the future the Council will doubtless include in New and Nonofficial Remedies those liver and stomach preparations which comply not only with their regulations dealing with claims and methods of advertising, but also with the potency standards of the U. S. Pharmacopeia.

1. The board is composed of Dr. C. W. Edmunds, chairman, Dr. William B. Castle, Dr. Raphael Isaacs, Dr. George R. Minot and Dr. W. W. Palmer. Report on Potency of Liver Products, J. A. M. A. **110**: 812 (March 12) 1938.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Admission and Collection System Attacked in Charges of County Hospital Graft.—A grand jury investigation of the system of admission and collections at the Los Angeles County General Hospital is suggested in an article by Dr. George H. Kress, published in the February issue of *California and Western Medicine*. Dr. Kress takes exception to the practice of billing all indigents for hospitalization charges. In addition he terms the amounts charged "stupid and outrageous." He charges that since July 1, 1937, when a new system of admission and collections was introduced at the hospital, the administration has overstepped its bounds in billing all indigents. Prior to July 1, billing was restricted to those hospital patients for whom bills were recommended by the hospital social service department. In answer to an inquiry from Dr. Kress the superintendent of charities stated: "It was felt that it would be more equitable to bill all patients and then arrange payments in accordance with financial ability, rather than bill only a restricted group selected on the basis of immediate financial ability." Charges were made to conform, so far as possible, to the actual cost to the county of providing care, it was said. Under the new system, the client is made aware of his obligation even though there is no immediate prospect of payment. Dr. Kress criticizes this practice and asks the purpose of an elaborate system of bookkeeping to carry accounts which are known in advance to be of no value, in view of the fact that indigent or near indigent are classified as "free" patients. In some instances efforts have been made to force patients to give liens on insurance and property they may have in the future; many patients have been "bombarded" with bills, the letters being almost mandatory in their request for payment, the article asserts. The department of charities, replying to Dr. Kress, denied that the Kern County Hospital Appellate Court opinion, rendered in January 1936, which declared that county hospitals may hospitalize and care only for indigent or near indigent persons, was used as a basis for claiming reimbursement from a county client. The opinion was considered, however, when the board of supervisors adopted a new schedule of charges for hospital care, based on a cost accounting system, to supersede the old flat rate of $4 per day. In his analysis of the system at the hospital, Dr. Kress uses the total of 56,774 inpatients who received care in the fiscal year 1936-1937. For this group the average number of patient days was 14.7. There are 508 physicians, surgeons and specialists who give their services gratuitously to the institution, the value of which to the group of 56,774 was estimated to be $2,000,000. In contrast, Dr. Kress compares the fund of $2,865,654 collected by the Community Chest from 1,000,000 persons in Los Angeles. For the period 1936-1937 the county

received $306,974.02 on accounts for the Los Angeles County Hospital, indicating that the institution received payment from patients while the entire group of professional persons providing the care received not one cent. From July 1 to Nov. 1, 1937, bills amounting to $1,169,921.87 were prepared by the hospital business office; on this basis the total amount of bills sent out for hospitalization to cover the entire year would be $3,509,765.61. About 90 per cent of the statements appear to be "bureaucratic bookkeeping," Dr. Kress declares, pointing out that maintenance of the bureau that sends out these notices cost $109,383.09, or 18.7 cents on the dollar collected.

DISTRICT OF COLUMBIA

Dr. Overholser Named Professor of Psychiatry at George Washington.—Dr. Winfred Overholser, superintendent of St. Elizabeth's Hospital, Washington, has been appointed professor of psychiatry and executive officer of the department of psychiatry at George Washington University School of Medicine, succeeding the late Dr. William Alanson White. Dr. Overholser's appointment as superintendent of St. Elizabeth's Hospital was reported in THE JOURNAL, Oct. 2, 1937, page 1132. Announcement of the university appointment, which is effective next September, was made February 24 at a luncheon in his honor. Before the luncheon Dr. Overholser delivered the Smith-Reed-Russell Lecture.

FLORIDA

Personal.—Dr. Albert H. Freeman, Ocala, has been elected a life member of the Florida Medical Association. A past president of the association, Dr. Freeman has been a member of the profession for thirty-five years and was recommended as a life member by the Marion County Medical Society.

Society News.—Dr. Arthur J. Logie, Jacksonville, among others, addressed the Polk County Medical Society January 12 on "Value and Significance of the Tuberculin Test."——The Dade County Medical Society was addressed January 4 by Dr. James J. Nugent, Miami, on "Pathologic Factors in Gallbladder Disease."——A symposium on sulfanilamide was presented before the Duval County Medical Society February 1 by Drs. Elijah T. Sellers, Thomas E. Buckman and John C. O'Dell Jr. All are of Jacksonville.——Dr. Robert B. McIver, Jacksonville, discussed "Surgical Lesions of the Kidney" before the Lake County Medical Society in Leesburg January 6. He spoke before the Gadsden-Liberty-Wakulla-Jefferson County Medical Society in Quincy January 20 on perinephric abscesses; Dr. James L. Borland, Jacksonville, also addressed this meeting on "Differential Diagnosis of the Dysenteries."

ILLINOIS

Inspection of Diagnostic Laboratories.—A plan to inspect and appraise the public and private diagnostic laboratories in Illinois has been announced by the state department of health. The immediate object is to improve and standardize laboratory tests for syphilis. Each laboratory that volunteers to participate in the plan will be inspected at intervals by a representative of the state department of health. Assistance will be offered when needed, and standard antigen for making blood tests for syphilis will be provided by the department. Certificates of approval will be issued by the department to each laboratory maintaining the required technical and professional standards and a register of all approved laboratories will be kept. There are about 225 of these laboratories in the state.

Chicago

Branch Meetings.—The Evanston Branch of the Chicago Medical Society was addressed February 3 by Drs. Thomas E. Jones, Cleveland, on "Carcinoma of the Rectum"; Stanley E. Monroe, Evanston, "Significance of Peritoneal Exudates as an Aid in Prognosis," and Jerrold P. Nesselrod, Evanston, "The Pelvic Lymphatics." At the meeting March 3 the speakers were Drs. John S. Coulter, Chicago, and John R. Merriman, Evanston, on "Experience with Artificial Fever Therapy" and Lowell D. Snorf on "Common Disorders of the Colon." Dr. Emil Ries addressed the Englewood Branch March 1 on "Gynecological Backaches and Treatment."

Society News.—Dr. Gregory Zilboorg, New York, among others, participated in an all day conference sponsored by the Council of Social Agencies of Chicago February 23; his subject was "Psychiatry and Human Behavior."——The Chicago Council of Medical Women was addressed March 4 by Lillian Eichelberger, Ph.D., on "Experimental Hydronephrosis," and Dr. Julia Faith S. Fetterman, Philadelphia, "Symptoms and Signs of Urinary Disease in Women."——A symposium on hyperparathyroidism was presented before the Chicago Urological Society February 24 by Drs. Fuller Albright and Richard Chute, both of Boston.——Dr. John R. Norcross addressed the Chicago Orthopaedic Society March 11 on "Sympathicoblastoma"; Dr. John J. Fahey, "Muscular and Skeletal Changes in Arachnodactyly," and Dr. Harold A. Sofield, "Steel Pin Fixation for Fractures of the Neck of the Femur."

INDIANA

Society News.—A symposium on public health aspects of tuberculosis case finding and treatment was presented before the Indianapolis Medical Society, March 15; the speakers were Drs. Herman G. Morgan, Argal E. Hubbard and Willis D. Gatch. The Indianapolis Ophthalmology and Otology Society will present the program March 22; speakers will include Dr. Bernard J. Larkin on "The Eye as an Index of Systemic Pathology." Dr. Fred L. Adair, Chicago, will address the Indianapolis Medical Society March 29 on "Maternal, Fetal and Neonatal Morbidity."

Forty Years with State Hospital.—Dr. Max A. Bahr, superintendent of the Central State Hospital and professor of mental and nervous diseases and head of the department of psychiatry, Indiana University School of Medicine, Indianapolis, completed forty years as a member of the staff of the state hospital March 1. He served first as assistant physician and later as clinical psychiatrist at the hospital, becoming superintendent in 1923. He was president of the Indianapolis Medical Society in 1932 and president of the Indiana State Conference on Social Work in 1935. According to the state medical journal, Dr. Bahr conducted the first clinical courses in forensic psychiatry for lawyers in America.

IOWA

Refresher Courses.—A series of courses in pediatrics and obstetrics will again be offered at various centers this spring under the auspices of the speakers' bureau of the state medical society, the Iowa Pediatric Club, the State University of Iowa College of Medicine, the Central Association of Obstetricians and Gynecologists and the state department of health. There will be eight two hour lectures, four on pediatrics and four on obstetrics. Dr. Everett D. Plass, professor of obstetrics and gynecology at the state university college of medicine, will direct the courses in this subject, and various pediatricians throughout the state will present the pediatric lectures.

Isolation Replaces Quarantine for Scarlet Fever.—The Iowa State Department of Health has instituted a new system of isolating all persons infected with scarlet fever, replacing the quarantine plan. In the past only those who had scarlet fever rash were quarantined, with the result that many mild cases that were not isolated and many patients who did not have the rash but who harbored the germ of scarlet fever in the throat spread the disease. Isolation will now apply to all persons having any symptom or sign suggesting scarlet fever, including cases without rash. In the future a placard giving notice of scarlet fever in a home will supplant the former method of twenty-one day quarantine. The placard will remain posted at the patient's home for a minimum of twenty-one days from onset of symptoms. Under the new system it will be possible for the breadwinner to enter and leave the home, provided he is not a food handler, does not come in contact with groups of children and gives evidence of immunity to scarlet fever. The change was effective March 15.

KANSAS

Society News.—The Bourbon County Medical Society was addressed in Garnett January 25 by Drs. Tony G. Dillon and Hjalmar E. Carlson, both of Kansas City, Mo., on "Modern Treatment of Gonococcic Infections" and "Differential Diagnosis of Lower Abdominal Pain" respectively.——Dr. Wendell M. Tate, Peabody, gave a summary of the literature on insulin shock therapy before the Marion County Medical Society in Marion February 2 and Dr. Russel R. Nykamp, Peabody, discussed tuberculosis control.——At a meeting of the Pratt County Medical Society in Pratt January 28, Dr. Clarence W. Hall, Hutchison, spoke on "Clavicular Fractures."——The Sedgwick County Medical Society was addressed in Wichita March 15 by Drs. Earl L. Mills on "Diagnostic Hints from Blood Pictures," and Wayne C. Bartlett, "Metastases of Carcinoma of the Breast." The society was addressed March 1 by Drs. Hal E. Marshall on "Sinusitis—A Practical Viewpoint" and Willard A. Phares, "Etiology of Gastric and Peptic Ulcers." All are of Wichita.

KENTUCKY

Physicians Honored.—Drs. William C. Ussery, Paris, and Wilson G. Dailey, Millersburg, were guests of honor at a dinner and meeting of the Bourbon County Medical Society in Paris, February 18. Dr. Dailey was the first president of the society in 1903 and Dr. Ussery has been president five times. At the meeting Dr. Charles G. Daugherty read a history of the society and a paper presented by Dr. Ussery in 1905 on "Methods of Conducting the Bourbon County Medical Society." Dr. Dailey read a paper he wrote thirty-five years ago on "Experiences of a Mountain Physician." Drs. James A. Orr, Paris, and Charles A. Vance, Lexington, paid tribute to the guests of honor. Dr. Byron N. Pittenger, Paris, president of the society, presided.

MINNESOTA

Society News.—Dr. Edward A. Regnier, Minneapolis, presented a paper before the Minnesota Academy of Medicine in St. Paul February 9 entitled "Clinical Tetanus: A Survey; Report of Cases with Unusual Early Symptoms."——Dr. William A. Pusey, Chicago, addressed the Hennepin County Medical Society March 7 in Minneapolis on "A Balance Between Clinical and Laboratory Medicine." The society was addressed February 9 by Drs. Paul F. Dwan and Erling S. Platou on "Treatment of Rheumatic Fever" and "Newer Developments in the Treatment of Epidemic Meningitis" respectively.

The Jackson Lecture.—Dr. Roy Graham Hoskins, research associate in physiology, Harvard University Medical School, Boston, delivered the annual Clarence M. Jackson Lecture at the University of Minnesota Medical School, Minneapolis, February 16, under the auspices of Phi Beta Pi; his subject was "Hormone Factors in Personality." The lecture was established several years ago in honor of Dr. Jackson, head of the department of anatomy. Dr. Hoskins addressed a joint meeting of the Minnesota Pathological Society and the Hennepin County Medical Society February 15 on "Hormones in Modern Pathology."

MISSOURI

Health Forum.—A series of free lectures will be presented through the Jackson County Health Forum, a newly organized project to advance medical and health knowledge for the public. Sponsored by the auxiliaries of the accredited hospitals of Jackson County, the lectures will be presented by guest speakers the third Wednesday night of every month except July and August. As an adjunct to the forum, the auxiliaries will maintain office hours every day in the Argyle Building for the benefit of the public to offer suggestions for health education. The Jackson County Medical Society has approved the project, but definite dates of the lectures have not been announced.

Society News.—Dr. Jonathan C. Meakins, Montreal, discussed "Basic Sciences and Clinical Medicine" before the Kansas City Academy of Medicine January 21. Dr. Joseph Earle Moore, Baltimore, discussed "Latent Syphilis" at a meeting February 18.——The St. Louis Medical Society was addressed March 1 by Drs. Lee Pettit Gay on "The Dietary Control of Essential Hypertension"; Lawrence Schlenker, "X-Ray Sputum and Pneumothorax," and Oscar D. Meyer, "Syphilis (A Probable Cause of Many Accidents)."——The South Central Counties Medical Society was addressed in Houston February 3 by Drs. Oswald P. J. Falk, St. Louis, on "The Treatment of Hypertension and Its Complications"; Clinton K. Higgins, St. Louis, "The Present Day Therapy of Varicose Veins," and Andrew B. Jones, St. Louis, "The Neuroses of Mild Mental Illnesses."—— At a meeting of the Cape Girardeau County Medical Society in Cape Girardeau February 14 Dr. Lawrence D. Thompson, St. Louis, discussed pneumonia.——Dr. William A. Hudson, Detroit, discussed "Collapse Therapy—Its Principles and Application in the Treatment of Pulmonary Tuberculosis" before the St. Louis Trudeau Club March 8.

NEW JERSEY

Society News.—Dr. Foster Kennedy, New York, addressed the Academy of Medicine of Northern New Jersey at its twenty-seventh anniversary meeting in Newark March 18 on "The Preventive Aspects of Neurological Medicine." Dr. Sara M. Jordan, Boston, addressed the academy March 8 on "Treatment of Constipation and Other Functional Disorders of the Colon."

Survey of Tuberculosis in High Schools.—A report was recently published showing the results of a tuberculosis survey among high school students in Jersey City made under the direction of the board of managers of the Hudson County Tuberculosis Hospital and Sanatorium. The state and county medical societies, the Hudson County Tuberculosis League, the board of education and city authorities cooperated in the campaign. A course on Mantoux testing and interpretation was offered to physicians and an educational campaign was carried out in the schools. Of a total enrolment of 14,952 students, 12,542 were tested; 4,643 reacted positively. The adult type of tuberculosis was found in sixteen students, childhood type in 255, tuberculous glands in two, pleurisy in seventeen. The results were doubtful in fourteen cases. Reports were made whenever possible to the private physicians named by students on their consent cards. It was recommended that follow-up work be done by the family physicians, but when this was not possible arrangements were made with clinics.

NEW MEXICO

Outbreak of Botulism in Tucumcari.—Nine persons died recently in an outbreak of botulism caused by home canned chili served to twenty-four persons at a funeral luncheon in Tucumcari. Three others became ill but recovered; two developed slight symptoms, but it was not certain that they had eaten of the chili. Six others reported that they probably had eaten some and received prophylactic antitoxin. Four did not taste it. Those who ate the chili in what might be considered ordinary amounts became ill almost exactly eighteen hours later, according to the report of the state department of public health. The others who ate smaller amounts were sick later. The first symptoms were disturbances of vision; slow and regular pulse at first, but becoming irregular and faster; subnormal temperature. Tightness in the throat developed, followed by difficulty in swallowing first and then in talking. There was no pain and the mentality was clear. The cause of death in each case was respiratory paralysis. Following the clinical diagnosis of botulism by the attending physicians, samples of the suspected chili were forwarded to the state laboratory at Albuquerque and to the U. S. Food and Drug Administration office in Denver. Both laboratories confirmed the diagnosis and stated that the causative toxin was of type A.

NEW YORK

Personal.—Dr. James H. Lade, recently on the syphilis staff of Johns Hopkins Hospital, Baltimore, has been appointed medical consultant to the division of syphilis control in the state department of health.——Dr. John S. Cunningham, epidemiologist in the Connecticut State Department of Health, Hartford, has been appointed district health officer in charge of Livingston, Monroe and Wayne counties.

Society News.—Dr. Henry D. Niles, New York, addressed the Medical Society of Sullivan County, Liberty, March 9, on "Physical Therapy in Relation to Dermatology, Exclusive of X-Rays and Radium."——Dr. Henry W. Miller, Brewster, addressed the Putnam County Medical Society in February on "Psychiatry and the General Practitioner."——Dr. Hyman Sneierson, Binghamton, addressed the Broome County Medical Society March 8 on "Intestinal Obstruction."

Professor of Anatomy Appointed.—Dr. Philip B. Armstrong, professor of anatomy at the University of Alabama School of Medicine, has been appointed professor of anatomy at the Syracuse University College of Medicine. He succeeds Dr. Henry W. Stiles, who retired July 1, 1937. Dr. Armstrong graduated from Cornell University Medical College, New York, in 1926 and was on the staff of the department of anatomy there until 1937. He will go to Syracuse July 1.

New York City

Biggs Memorial Lecture.—Dr. Thomas M. Rivers, director of the Hospital of the Rockefeller Institute for Medical Research, will deliver the annual Hermann Michael Biggs Lecture of the New York Academy of Medicine, April 8. His subject will be "Virus Diseases."

Harvey Society Lecture.—Wendell M. Stanley, Ph.D., associate member of the Rockefeller Institute for Medical Research, Princeton, N. J., delivered the sixth Harvey Lecture of the current series at the New York Academy of Medicine, March 17. His subject was "The Isolation and Properties of Tobacco Mosaic and Other Proteins."

Mental Hygiene Clinics Established.—Mental hygiene clinics have recently been established at Morrisania and Queens General hospitals, the city department of hospitals announces. The new clinics, which will be subdivisions of the psychiatric division of the department of hospitals, will have two psychiatrists, a psychologist, two psychiatric social workers, two nurses and two stenographers. Dr. Hyman L. Rachlin is in

110
938

charge at Morrisania and Dr. Charles Schultz at Queens. Previously clinics have been provided only at Bellevue and Kings County hospitals.

Academy Medal Awarded to Dr. Schick.—The New York Academy of Medicine at a meeting March 3 awarded its gold medal to Dr. Bela Schick in recognition of the twenty-fifth anniversary of his announcement of the Schick test for susceptibility to diphtheria. The presentation was made by Dr. James Alexander Miller, president of the academy, who pointed out that the Schick test laid the basis for the present day effective campaign of prevention against the disease. Dr. Schick, a native of Hungary, practiced in Vienna from 1902 to 1923 and was professor of pediatrics at the University of Vienna for the last five years of that period. In 1923 he came to the United States. He is pediatrician in chief at Mount Sinai Hospital and Sea View Hospital, consulting pediatrician at Willard Parker Hospital and the New York Infirmary for Women and Children.

OHIO

New Medical Library Is Memorial to Dr. Brittingham.—The Harold H. Brittingham Medical Library was dedicated at City Hospital, Cleveland, January 25, with ceremonies at which Dr. Howard T. Karsner, professor of pathology, Western Reserve University School of Medicine, and Mr. Fred W. Ramsey, director of public health and welfare, gave the principal addresses. After Dr. Brittingham's death in January 1937, a fund of $7,000 was collected to establish the library as a memorial to him. The city agreed to furnish library space and a librarian, and a membership plan was devised to provide continued support. The library already contains more than 1,000 volumes and receives forty-five current journals. Dr. Brittingham was a member of the staff of the hospital from 1923 until his death and since 1935 had been assistant head of the department of medicine.

OKLAHOMA

Society News.—Drs. Wann Langston and Harry Wilkins, Oklahoma City, addressed the Pittsburg County Medical Society, McAlester, January 25, on "Coronary and Heart Diseases" and "Injuries of the Spinal Cord" respectively.——At a meeting of the Woods County Medical Society, Alva, January 25, the speakers were Drs. Green K. Dickson and John H. Lamb, Oklahoma City, on surgery of the intestine and skin diseases in children, respectively.——Drs. Ivo A. Nelson and Walter S. Larrabee, Tulsa, addressed the Muskogee County Medical Society, January 17, on "Pathology with Special Reference to Autopsy" and "Breast Tumors" respectively.——Dr. Willis C. Campbell, Memphis, Tenn., will address the Tulsa County Medical Society, March 28, on "Fractures In and About the Neck of the Femur." Dr. Joseph M. Hill, Dallas, Texas, addressed the society, January 24, on "Hemolytic Anemia."

PENNSYLVANIA

Society News.—Dr. David Riesman, Philadelphia, addressed the Delaware County Medical Society, Chester, March 10, on "The Family Doctor, Past and Future."——Dr. Curtis C. Mechling, Pittsburgh, addressed the Washington County Medical Society, Washington, March 9, on "Office Proctology."——Drs. Louis H. Clerf and Howard W. Bradshaw, Philadelphia, addressed the Northampton County Medical Society March 18 on "Pulmonary Infections and Their Treatment."——Drs. Jesse G. M. Bullowa, New York, and Edith MacBride-Dexter, Harrisburg, addressed the Cambria County Medical Society, Johnstown, March 10, on pneumonia control.

Philadelphia

Postgraduate Institute.—The Philadelphia County Medical Society will conduct its third annual Postgraduate Institute at the Bellevue-Stratford Hotel, March 28 to April 1. The general subject will be "Diseases of the Digestive Tract," presented in eighty-seven lectures by Philadelphia physicians and in technical and scientific exhibits. Members of all county medical societies are invited to attend. The registration fee will be $5.

Society News.—Drs. Arthur Bruce Gill and Francis C. Grant addressed the Philadelphia Academy of Surgery, March 7, on "Buried Hardware" and "Diagnosis and Treatment of Chronic Subdural Hemorrhage" respectively.——Dr. John J. Dailey, McAdoo, was elected president of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital at the recent annual dinner. Dr. George Wilson, Philadelphia, was reelected secretary.

Personal.—Dr. Emily P. Bacon has been elected a life member of the board of trustees of Wilson College, Chambersburg, and will receive the honorary degree of doctor of science at the college commencement in June.——Dr. George M. Dorrance was honored with a testimonial dinner February 17 by the staff of St. Agnes' Hospital marking his thirtieth year of service at the hospital. He received a surgical kit as a memento.——Dr. Harold L. Goldburgh has been appointed senior attending physician to the medical service of the Jewish Hospital.——Dr. John L. Laird has been appointed chief of the division of laboratories in the city department of health.——Dr. George Morton Illman, associate professor of medicine, Temple University School of Medicine, has been elected a member of the board of trustees of the university.

Professor Richards Wins Philadelphia Award.—Alfred Newton Richards, Ph.D., professor of pharmacology, University of Pennsylvania School of Medicine, has received Philadelphia's highest civic honor, the Philadelphia Award founded in 1921 by the late Edward W. Bok. The award, consisting of a gold medal, a scroll and $10,000, was conferred on Dr. Richards in recognition of his research on diseases of the liver and kidneys. Edwin G. Conklin, Ph.D., emeritus professor of zoology, Princeton University, Princeton, N. J., made the presentation at a meeting at the Philadelphia Academy of Music March 9. Dr. Richards, 61 years old, is a native of Stamford, N. Y., and was educated at Yale University and Columbia University. After teaching several years at Columbia and at Northwestern University, Evanston, Ill., he became professor of pharmacology at Pennsylvania in 1910. He has received various honorary degrees, including that of doctor of medicine from the University of Pennsylvania in 1932. In 1932 he received the Gerhard Medal, in 1933 the Kober and Keyes medals and in 1934 the John Scott Medal. The Philadelphia Award is conferred on a person "living in Philadelphia, its suburbs or vicinity, who, during the preceding calendar year, shall have performed or brought to its culmination an act or contributed a service calculated to advance the best and largest interests of the community of which Philadelphia is the center."

RHODE ISLAND

Society News.—Dr. Maxwell Finland, Boston, addressed the Providence Medical Association, February 7, on "The Specific Treatment of Pneumococcus Pneumonia"; Esther Brintzenhoff, A.M., and Dr. Charles F. Gormly, Providence, on "Bacteremia in Pneumonia" and "Nonspecific Measures in the Treatment of Pneumonia" respectively.——Dr. Emilio D'Errico, Boston, addressed the Washington County Medical Society, Westerly, January 12, on "Induction of Labor with Special Reference to the Artificial Rupture of the Membranes."——Dr. Hugh E. Kiene, Providence, recently addressed the Rhode Island Society for Neurology and Psychiatry in Providence on "Insulin Shock Treatment in Schizophrenia."

SOUTH CAROLINA

Personal.—Dr. Henry W. Tobias, medical officer at the Veterans Administration Facility, Batavia, N. Y., has been transferred to the facility at Columbia, replacing Dr. Oma E. Herndon, who has been transferred to Tuscaloosa, Ala.——Dr. Wofford E. Baldwin, formerly of Due West, has been appointed health officer of Dorchester County.

Tuberculosis Institute.—Philip P. Jacobs, Ph.D., director of personnel training and publications of the National Tuberculosis Association, New York, is conducting an institute for health workers at the University of South Carolina, Columbia, March 14-26, in cooperation with the state tuberculosis association. Among the speakers are Drs. Paul P. McCain, Sanatorium, N. C., on "Hospitalization and Institutional Care" and "Tuberculosis Among Negroes," and William Atmar Smith, Charleston, on the medical and scientific basis of the tuberculosis movement.

Society News.—Dr. Ruskin G. Anderson, Spartanburg, among others, addressed the Spartanburg County Medical Society, Spartanburg, January 24, on "Acute Laryngotracheobronchitis."——Drs. Ralph Mosteller, Spartanburg, and Thomas R. W. Wilson, Greenville, addressed the Anderson County Medical Society, Anderson, February 9, on "Blood Dyscrasias" and "Pathology of Infections of the Upper Respiratory Tract" respectively.——Dr. Bernard B. Raginsky, Montreal, Canada, addressed the Greenville County Medical Society, Greenville, February 7, on "The Present Status of Analeptics in Anesthesia."

V 1
193

TENNESSEE

Fund Raised for Meharry Cancer Clinic.—A gift of $20,000 from Mr. Edward S. Harkness, New York philanthropist, and $10,000 raised among friends and alumni have made possible the establishment of a cancer clinic at Meharry Medical College, Nashville. According to Dr. John J. Mullowney, president of the college, Mr. Harkness offered his gift after reading an annual report of the college setting forth the need, making a condition that the college raise $10,000.

Society News.—Drs. Fray O. Pearson, Livingston, and Venable L. Lewis, Crossville, addressed the five-county medical society representing Putnam, Cumberland, Jackson, Overton and White counties in Cookeville January 20 on Rocky Mountain spotted fever and sulfanilamide, respectively.—— Dr. Ola E. Ballou, Clinton, discussed "Diseases of the Cervix" at a meeting of the Anderson County Medical Society, Clinton, February 7.——Drs. Joseph R. Bowman, Johnson City, and Horace B. Cupp, Mountain Home, addressed the Washington County Medical Society, February 3, on "Lipoid Pneumonia" and "Tannic Acid in Treatment of Burns" respectively.—— At a meeting of the Carroll, Henry and Weakley Counties Medical Society, McKenzie, February 8, the speakers, all of Nashville, were Drs. Carl R. Crutchfield, on "Surgical Management of Duodenal Ulcer"; Jefferson C. Pennington, "Management of Stones in the Upper Renal Tract," and Jack Witherspoon, "Common Duct Stones."—— Drs. Charles K. Lewis and Charles H. Heacock, Memphis, addressed the Memphis and Shelby County Medical Society, January 18, on "Osteomyelitis of the Frontal Bone Following Sinusitis" and "Treatment of Carcinoma of the Breast" respectively.

TEXAS

Personal.—Dr. and Mrs. Thomas B. Taylor, Bastrop, recently celebrated their fiftieth wedding anniversary.—— Dr. Emil Aronson, Dallas, celebrated the fiftieth anniversary of his medical practice recently with a dinner attended by colleagues and other friends.——Justin F. Kimball, LL.B., Dallas, was guest of honor at a dinner meeting of the Dallas Chamber of Commerce, February 24, in recognition of his work in the development of group hospitalization. The American Hospital Association conferred on him at that time an honorary life membership. Dr. Bert W. Caldwell, Chicago, executive secretary of the association, and Mr. Robert Jolly, superintendent of the Memorial Hospital, Houston, were among the speakers. Mr. Kimball is executive vice president of Baylor University in charge of the scientific schools and hospitals in Dallas.

110
938

ALASKA

Personal.—Dr. Howard G. Romig, Anchorage, has been appointed a member of the Alaska Board of Medical Examiners succeeding the late Dr. Arthur D. Haverstock.

GENERAL

Orthopedic Board Examination.—The American Board of Orthopaedic Surgery will hold examinations in Chicago June 10-11. Application must be submitted before April 1 to the secretary, Dr. Fremont A. Chandler, 6 North Michigan Avenue, Chicago.

Warning of Impostors.—A North Carolina physician recently reported that hospitals in that state have been defrauded by a man who visits a hospital on Sunday, saying that he or his son will enter the hospital the next day and giving the name of a local physician. When asked to pay for a room a week in advance he presents a check drawn on a local bank for about $20 more than the hospital bill, thus collecting the change. This man has used the names Martin and James.—— A fraudulent instrument repair man is reported to be operating in the Southeastern states. In Jacksonville, Fla., he recently used the name Morrison, claiming that he represented a firm called Morrison and Company, 417 Spring Street, Atlanta, specializing in repair of instruments at a low price. It is stated that this firm does not exist.

Helium for Medical Use Procurable from U. S. Bureau of Mines.—By an act approved Sept. 1, 1937, the Bureau of Mines, U. S. Department of Interior, was authorized to maintain and operate helium production and repurification plants and to sell any helium produced, but not needed for government use, for medical, scientific and commercial uses. Regulations governing the production and sale of helium for such uses were approved by the President, January 14. Persons, firms, corporations, associations or institutions desiring to purchase what the regulations refer to as "market helium" must make application therefor on forms procurable from the U. S. Bureau of Mines, Washington, D. C. On receipt of such an application, the bureau will determine whether or not the desired quantity of helium can be supplied, and so far as practicable applications for helium for medical use will be given preference over applications for helium for other nongovernmental uses. If the bureau can supply the requested helium, it will so notify the applicant and furnish him with estimates of the cost and of the delivery schedule and notify him of the amount of the deposit required. If the applicant desires to purchase the helium under the terms named, he must execute the necessary contract within ten days. Shipping containers for market helium sold for nongovernmental uses must be supplied by the purchaser, unless otherwise agreed on by the Bureau of Mines in writing, but whether or not containers are furnished by the purchaser or by the government, the government will not assume liability for delays in delivery, loss of containers, faulty or leaky containers, loss of helium in transit or variations in purity. Any helium sold by the Bureau of Mines for nongovernmental purposes that has not been lost or dissipated may be repurchased by the government at any time if needed for government use.

American College of Physicians.—The twenty-second annual session of the American College of Physicians will be held in New York April 4-8 at the Waldorf-Astoria. There will be general sessions Monday afternoon and evening and each morning thereafter, at which about fifty scientific papers will be delivered. Each day after Monday there will be round table luncheons for discussion of a variety of topics. In the afternoons a course of lectures will be presented at the Waldorf-Astoria. In addition, one or more clinics will be conducted each day at Bellevue, New York, Mount Sinai and Presbyterian hospitals; during the meeting St. Luke's, Roosevelt, New York Post-Graduate and Long Island College hospitals will offer one clinic each. A new feature this year will be special demonstrations at Bellevue, New York, Presbyterian and Mount Sinai hospitals. Among the topics for these demonstrations are therapeutic use of oxygen and helium, fever therapy, high voltage x-ray machine, assay of sex hormones, a metabolism unit for research, technical methods for studying the functions of the liver in disease, cutaneous syphilis and bronchiectasis. The annual convocation will be held Wednesday evening April 6, with Karl T. Compton, Ph.D., president of Massachusetts Institute of Technology, Cambridge, as the orator. Dr. Compton's subject will be "Possibilities in Biological Engineering." At this session the Phillips Memorial Medal for 1937-1938 will be awarded to Dr. Harry Goldblatt, professor of experimental pathology, Western Reserve University School of Medicine, Cleveland. Dr. James Howard Means, Boston, president of the college, will deliver his official address. The annual banquet will take place Thursday evening, with Dr. James Alexander Miller, New York, as toastmaster. John H. Finley, LL.D., editor of the New York *Times*, will give the address of the evening on "Education in a Changing World."

FOREIGN

The Croydon Typhoid Epidemic.—The conclusions of an investigation into the recent epidemic of typhoid at Croydon, England, in which 344 cases with forty-three deaths had been reported up to February 5, were published in the *British Medical Journal*, February 19. It was found that the public water supply had been contaminated by water from one of its main sources, a chalk well at Addington, in which a typhoid carrier was working. Changes in the construction of the well were in progress during the last days of September and the month of October. During this time it was not possible to pass the output of the well through the filtering and chlorinating apparatus. For the first half of the period the water was pumped away while the work was in progress, but from October 16 to November 3 it was pumped into the general supply. Sanitary facilities for the workmen were such that contamination of the water was possible, it appears from the report. During the inquiry it was brought out that the medical officer of health was unaware that work was being done on the well and that even the borough engineer did not know that the chlorinating plant was not in operation. The first case of typhoid was reported October 27, followed by others on succeeding days. The medical officer and the engineer learned of the possibility of contamination of the well water October 31 and chlorination was applied immediately. By November 4 the primary sources of infection had ceased to operate and it was considered that water in mains and cisterns played no part after that date. The report concluded with the statement that "The infection was due to an unfortunate and rare coincidence of three factors—(a) constructive changes taking place in the well, (b) one of the workmen being a typhoid carrier, and (c) the process of chlorination being in abeyance."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 19, 1938.

The Medical Aspects of Decline of Population

At the section of Obstetrics and Gynecology of the Royal Society of Medicine an important discussion took place on the medical aspects of decline of population, in which sociologists, gynecologists and physicians took part. It was opened by Prof. A. M. Carr-Saunders, sociologist, who said that the decline of the birth rate in many countries of northwestern Europe had been in the neighborhood of 50 per cent within the last sixty years. There might be many causal factors. There might be a decrease in the natural capacity for child-bearing. Conceivably less fertile varieties might become more numerous by selection or mutation. But he could not think that this cause had been seriously operative within the last two or three generations. The second possible cause was a decrease in intercourse, including a decline in marriages. But the tendency had been to more marriages during the period of declining fertility. The third possible cause was the use of contraceptives or altered modes of life which were inimical to fertility. The fourth possible cause was greater frequency of abortion.

Though about twenty speakers took part in the discussion, the new light that was thrown on the subject was limited. Prof. J. C. Drummond, biochemist, made the new and important suggestion that changes in our national diet had an influence on fertility, particularly shortage of vitamins B and E. No fallacy was more widely held than that a mixed diet afforded protection against all forms of dietary deficiency. In the common foodstuffs, few were rich in vitamin B or E. These were present in considerable amount in only one food—the germ of most of the cereals. The decline of the birth rate first became evident about fifty or sixty years ago, which corresponded with the time when the change over from whole meal to white bread rapidly occurred as a result of the introduction of the roller mill. The removal of the germ, which the new process made possible, brought about a sharp decline in the amount of these vitamins in the everyday diet. The intake of a poor person, living largely on bread, fell from about 800 to 250 international units daily.

Prof. James Young, gynecologist, said that abortion and contraception were generally believed to constitute the effective influence in the declining birth rate. In a survey of reproductive histories in a medical unit he found that the abortions constituted 10.8 per cent of the pregnancies. Abortion appeared to be increasing and there was evidence that dietetic factors might be concerned; namely, the success obtained by treatment with vitamin E and the high proportion of development defects found in aborted ova which might be ascribed to nutritional deficiency.

Sir Leonard Hill, physiologist, referred to the aging of our population—the decrease in the number of children and the greater longevity of the old. For many years all the energy had been put into the prevention of death, not into the production of young life. Probably making people live to a greater age reduced births. But birth control was at the bottom of the diminution of the birth rate. He urged the adoption of the methods used in Germany and Italy—family allowances, reduction of taxes, dowries for marriages, bonuses for children, crèches where mothers could leave their children, the removal of disabilities attaching to illegitimacy, and the prohibition of the condition for employment that the candidate must be unmarried.

Compensation for Miners' Nystagmus

The committee appointed by the government to investigate miners' nystagmus has presented its report. The committee finds that the low standard of illumination underground is the main cause of nystagmus. The standard necessary to prevent it has not yet been reached, and the use of the electric cap lamp should be encouraged. A case should not be certified unless oscillations persist for a definite period. Medical boards, empowered to give a conclusive decision, should be set up in the different coal fields to ascertain the extent of disablement, to make periodic examinations and to advise when a man is fit for work. As work plays a large part in the treatment of the disease and if the workman does not get work he is liable to develop a psychoneurosis of a serious type, employers are recommended to cooperate in finding remedial work. The employer's liability in respect to nystagmus should be covered by insurance. In the case of men severely affected before the age of 30, the medical board should have power to suspend them from the work and in the case of older men to advise them against further work on the coal face.

PARIS

(From Our Regular Correspondent)

Feb. 19, 1938.

Relation of Adrenal Dysfunction to Gastric Ulcer

At the Dec. 17, 1937, meeting of the Société médicale des hôpitaux of Paris, a paper was read by Dr. Hernando in which three cases of pyloroduodenal ulcer were reported in patients who presented evidence of marked adrenal insufficiency. When both adrenals are removed in animals, various lesions of the gastrointestinal mucosa, such as erosions, as well as superficial and deep ulcerations, are observed. These lesions resemble similar conditions in human beings. In experimental work, superficial hemorrhages and erosions are more frequently found than round deep ulcers. These superficial lesions most frequently occur in the pyloric region, but they are also found along the lesser curvature and the pyloroduodenal zone. In patients presenting adrenal lesions, one finds gastric erosions and even ulcerations. The latter are rarely seen clinically because this is equally true of Addison's disease.

Another reason why gastroduodenal ulcers are so seldom seen in this disease of the adrenals is that the majority of the patients suffering from adrenal insufficiency manifest evidence of anachlorhydria at a comparatively early stage; furthermore, an active gastric secretion plays an important part in the etiology of gastric ulcers even though hyperacidity does not exist. All of the reported cases were in males and the symptoms of digestive disturbances appeared early. The disease is slow in development and there was always free hydrochloric acid present even though hyperacidity was rarely found. The author did not believe that adrenal insufficiency was responsible for all gastric and duodenal ulcers, but it would be interesting to study further the relation between the two conditions. It might throw light on the etiology of gastroduodenal ulcers.

In the discussion, Dr. Marquezy called attention to the studies made by Dr. Reilly of Paris, who found that stimulation of the splanchnic nerve either by toxins or by chemical agents was followed by ecchymoses in the gastrointestinal mucosa, hyperemia of mesenteric lymph nodes and hypertrophy of Peyer's patches. Professor Loeper was of the opinion that the splanchnic nerve was only indirectly responsible for such lesions. Removal of the adrenals causes disappearance of substances having to do with the tonus of the sympathetic system. In closing the discussion, Dr. Hernando emphasized the fact that these gastroduodenal ecchymoses are common and are due to a number of different mechanisms. In addition to disturbances of the nervous system, one must remember that humoral changes also are concerned. As examples of the diversity of these mechanisms, Dr. Hernando recalled the observation that cinchophen is toxic for the gastric mucosa whereas caffeine stimulates the secretion of hydrochloric acid.

V 1
193

Inhibitory Action of Sulfanilamide and Analogous Drugs on Spermatogenesis

At the December 17 meeting of the Société médicale des hôpitaux a report of the examination of the spermatic fluid in twenty-three cases of gonorrhea treated with sulfanilamide and analogous preparations was made by Drs. A. Jaubert and Charles Motz of Paris. The number of spermatozoa was found to be normal in 39.13 per cent of the twenty-three cases, moderately decreased in 30.43 per cent and very much diminished in 30.43 per cent. The motility of the spermatozoa as well as their shape was noticeably changed. This toxic action appears as soon as treatment with these newer preparations is begun and appears to continue. In cases of gonorrhea treated by the older methods the spermatozoa are normal in 89.5 per cent of the cases, moderately decreased in 7.8 per cent, very markedly decreased in 0.4 per cent and show azoospermia in 8.2 per cent. All cases in which complications such as epididymitis, prostatitis and vesiculitis presented were excluded from these observations.

Election of Dr. Peyton Rous as Fellow of Academy of Medicine

At the February 8 meeting of the Académie de médecine of Paris, Dr. Peyton Rous of the Rockefeller Institute of New York was unanimously elected a corresponding fellow. This is a well merited recognition of the work of Dr. Rous in the experimental production of neoplasms.

Experimental Study of Reflex Ureteral Action on Intestine

Many years ago, Prof. James Israel called attention to a condition which he termed "renal ileus." He had observed a reflex paresis of the intestinal musculature following operations on the upper urinary tract. The clinical picture resembled closely that of an intestinal obstruction. The abdominal distension, emesis and inability to pass flatus were often erroneously diagnosed as ileus. Israel's observations have been confirmed by a number of others. A little later a similar reflex paresis of the intestine was described as a frequent accompaniment of the passage of ureteral calculi. When the pain incident to this condition was accompanied by the symptoms of a reflex intestinal paresis, many cases were diagnosed as appendicitis or intestinal obstruction and operations were performed. Since more exact methods of urologic examination have been employed in doubtful cases, such errors of diagnosis are rarely observed. A paper read at the February 5 meeting of the Société de biologie of Paris by Dr. Bariety and Miss Koehler is of considerable interest in explaining why such a reflex paresis of the intestinal musculature takes place. They made a series of experiments in which the ureters of dogs were stimulated and the effect on the intestine noted. Under ordinary conditions, i. e., when no drugs were employed, stimulation of one of the ureters is followed by a lowering of the tonus of the intestine with diminution of the amplitude of the contractions of the musculature. This is soon followed by increased tonus with or without diminution in the force of the contractions. These reactions increase in intensity in proportion to the increase in intensity of stimulation. In dogs to which yohimbine has been given, ureteral stimulation is followed by an increase in the amplitude of the contractions of the intestinal musculature and a transitory elevation of the tonus, and an early lowering of the tonus. In dogs that have been given atropine, there is a temporary rise in the tonus of the intestinal musculature, usually without increased contractions. This is followed by a prolonged lowering of the tonus and decrease in the amplitude of the contractions but a decrease in their frequency. In dogs that have been given physostigmine, either a lowering of the tonus with subsequent elevation is noted or an immediate rise with a marked lowering of the contractions resembling a spasmodic condition of the intestinal musculature. The intestine in a normal dog offers more resistance, so far as its tonus and contractions are concerned, to ureteral stimulation than the ureter which has been subjected to the influence of drugs which act on the sympathetic and parasympathetic nervous systems.

These experiments appear to confirm the reflex action on the tonus and contractions of the intestinal musculature of various ureteral conditions observed clinically.

Dr. Edmond L. Gros Elected President of American Library

At the annual meeting of the American Library of Paris, held recently, Dr. Edmond L. Gros, chief of staff of the American Hospital, was elected president for 1938.

BERLIN

(From Our Regular Correspondent)

Jan. 24, 1938.

New Statistical Studies of Cancer Mortality

Dr. Haubold, a cancer specialist, has undertaken for the National Health Bureau a comprehensive statistical survey of cancer mortality. (He uses the term "cancer" to denote malignant neoplasms of all kinds.) Repeatedly in the course of his investigations, Haubold found that a steadily increasing absolute number of cancer deaths have been reported in official statistical records of civilized countries and that this apparently greater incidence of the disease has been paralleled by a mounting feeling of apprehension. All sorts of explanations of these disconcerting data have been advanced. However, the search for "the" exogenous cancerigenic factor remains fruitless, apart from the field of occupational neoplasms, wherein it has actually been possible to recognize or isolate several cancerigenic factors. Among the more common interpretations of the increase in absolute numbers of cancer deaths are a shift in the age of the population and improved diagnosis. The author became convinced that recent statistical data on cancer mortality can best be evaluated by comparing it with similar data for a nonconsecutive earlier period, preferably the records of a carefully enumerated population for a period near the turn of the century. Such a comparative study should be based on complete statistics for exactly corresponding age groups and the populations studied should be numerically large. In Switzerland, for example, reliable data have been elicited on this basis. Haubold has used the population of Berlin for a similar study, a study that measures up to the criteria of validity which he himself has suggested. He selected as the most appropriate periods for comparison one prewar decade (1901-1910) and one postwar decade (1923-1932). From his computations of cancer mortality per 10,000 living persons in the various age groups and after due consideration of possible sources of error, the author elicited these facts: Among men in almost all age groups up to the seventieth year, a definite falling off in the number of deaths from cancer is discernible. For example, the cancer mortality of men in the sixth decade of life has declined from 38.6 to 31.3 and among men in the seventh decade from 83.8 to 77.9. Only beyond the seventieth year or, in other words, among senile men is a manifest increase, from 114.3 to 127.5, encountered. A similar trend was observed among women with the exception of those in the fourth decade of life. The rate for women at the latter level rose from 5.3 to 6.1, whereas the rate for men of the same age group remained stationary, 2.5 for both periods studied. Among women in the fifth decade of life the rate sank from 19 to 16.7, for those in the sixth decade from 38 to 34.7 and for those in the seventh decade from 65.4 to 63.6. Among senile women (aged 70 and over) the cancer mortality increased substantially, from 87.3 to 109.9. On the basis of the foregoing figures there seems to be no question at all of an increased incidence of cancer deaths among those age groups under 70 regarded as most imperiled by the

disease; rather a decrease in the death rate is discernible among both sexes (with the exception of women in the fourth decade of life).

Haubold then sought an explanation for the notable postwar increase in deaths from cancer among the aged of both sexes. He found, to his surprise, that in the prewar period "infirmities of age" was listed as an official cause of death three times as frequently as in the records of the postwar period. The author assumed therefore that a reciprocal interrelation was present between the decline in mortality from senile infirmities and the increase in that of cancer. The fact that the trend was identical for the two sexes further strengthened this hypothesis. From intensive comparison of the records, Haubold was able to prove that the formal certification of deaths as due to "infirmities of age" had obscured the true incidence of cancer in persons over 70 to a remarkable extent and that this circumstance constituted a source of statistical error. Furthermore, he found that deaths the cause of which is not mentioned or simply listed as "unknown" in the records, while numerous in the earlier period, are no longer statistically important in the later period. Lastly Haubold investigated the noteworthy increase in cancer mortality among women in the fourth decade of life. He found that in the prewar period studied (1901-1910) the younger women within this group, namely, those from 30 to 32 years of age, outnumbered the older women within the group, whereas in the postwar period studied (1923-1932) the reverse was true, the older women within the group preponderating. On this basis the author concluded that displacement in ages within a group would necessarily be followed by an increase in mortality from cancer.

Dr. Haubold summed up his observations thus: The statistics for Berlin plainly reveal that the mortality from cancer has tended since the beginning of the century to remain constant or to decline within several age groups. Deviations from this trend in the age groups over 70 and among women in the fourth decade of life are explicable on the basis of changed conventions of necrology and to a shift in preponderant age levels within an age group. The majority of age groups exhibit a definite decline in cancer mortality, and this is especially evident among women. It is at present impossible to evaluate the influence of successful therapeutics on this favorable trend. But it is obvious that even partially successful therapy may prolong life by several years so that the cancer patient may have attained an older age group before death. Such instances would of course influence the statistics. In any event the individual Berliner is in no greater peril of cancer today than he would have been in former years.

Death of Prof. Friedrich Moritz

Professor Emeritus Dr. Friedrich Moritz, for many years ordinarius in internal medicine at Cologne University, died January 12 at the age of 76. Moritz received intensive training in his particular field as assistant to Ziemssen at Munich, and subsequently he served for ten years as associate professor at the university medical policlinic there. He then filled the post of ordinarius consecutively at the universities of Greifswald, Giessen and Strasbourg. In 1911 he was called to Cologne. Moritz was swift to sense that the discovery of the roentgen rays portended a revolution in medical technic. This interested him in orthodiagraphy, the technic of which he developed in 1904. This proved to be one of Moritz's major contributions to medicine. In addition he initiated much important progress in the field of internal medicine. For example, in 1886 he devised the test for distinguishing fluids of transudation and exudation, named after him the Moritz reaction. Moritz enjoyed a great reputation in internistic circles and among medical men in general; he was for many years regarded as an authoritative and scholarly clinician.

AUSTRALIA

(From Our Regular Correspondent)

Jan. 19, 1938.

A New (?) System of Orthopedics

About six years ago in North Queensland a woman of strong personality with a flair for showmanship commenced treating long standing cases of infantile paralysis and other orthopedic conditions by a "new" method. Calling herself "Sister Kenny," she soon developed such an intensity of public opinion in her favor that the state government opened a clinic in North Queensland. Her claims were so spectacular that the government subsequently opened an "Elizabeth Kenny Clinic" in Brisbane, to be followed later by clinics in Sydney and Melbourne. Her fame became international and cripples came full of hope from South Africa, England and even America. A clinic was opened in London. Twelve months ago she published a textbook of her method, "Infantile Paralysis and Cerebral Diplegia," and she induced the dean of the Faculty of Medicine in the University of Queensland to write the introduction. The general attitude of the medical profession toward her has been wisely tolerant. The danger of martyrdom, in view of the strong public opinion in her favor, was a real danger. The best medical summary of her book was that "there was much in her book that was both good and new. Unfortunately that which was good was not new, and that which was new was not good."

At Elizabeth Kenny's request, the Queensland state government appointed in Brisbane in October 1935 a royal commission to inquire into her method. The members were selected by herself. The report has just been published. It is a fair report and was based on an enormous volume of honorary work on the part of the members. The striking feature of the report was that the Elizabeth Kenny method of treatment of infantile paralysis now differs essentially from orthodox treatment in only two points: the early movement of the limb during the stage of muscle tenderness, and the refusal to accept the principle of supporting every paresed muscle by suitable splinting. The terms of reference of the commission were to investigate the modern methods of treatment of infantile paralysis and other diseases of a paralytic nature and to investigate in particular the Elizabeth Kenny method of treating infantile paralysis, spastic paralysis and birth palsy, and to compare the results of this method with the results of orthodox treatment. The report stated that for some years Miss Kenny has been practicing in Queensland a method devised by herself for treatment of paralysis and has roused both public opinion and medical interest with her optimistic claims of cure. Her method, originally unorthodox, approaches now more nearly to orthodox procedure and is outlined in her textbook "Infantile Paralysis and Cerebral Diplegia."

Miss Kenny lays down five principles in treatment: (1) maintenance of a bright mental outlook, (2) maintenance of impulse, (3) hydrotherapy and remedial work, (4) maintenance of circulation, (5) avoidance of the generally accepted methods of immobilization. The Kenny clinics are designed to develop (1) to the greatest possible extent a psychologic outlook formative of both faith and hope. Miss Kenny, herself energetic and enthusiastic, is unstinting with positive statements of promised cure. Government funds to the tune of about £25,000 have been freely used to provide an admirable and inspiring machinery for the carrying out of the method—porcelain baths, colorful appointments, uniformed trainées, free transport and so on. Communal treatment and the intercourse of patients and friends in a cheery and optimistic atmosphere all help to maintain this psychologic outlook. In commenting the commission states that "by 'maintenance of impulse' Miss Kenny apparently means the maintenance of the nervous impulse to the muscles from the brain centers." Miss Kenny and her staff ask the patients

V 1
193

to visualize the part to be moved. This, of course, is of no use for very young patients.

In the use of hydrotherapy the commission concurs, with reservations, stating that as routine practice it is entirely unnecessary in many cases and would add much to the time and cost of treatment. Miss Kenny lays great stress on the individual bath as against pool bathing.

The maintenance of a good circulation, stressed in the Kenny method, is recognized as essential in orthodox treatment, although Miss Kenny would suggest that modern methods of treatment are detrimental to the circulation. She considers that immobilization reduces the vitality of the circulation to such an extent that it should be abandoned. The commission contends that in properly applied shell casts or in splints or frames the circulation is not impaired. These four principles, then, in their major points are in line with orthodox treatment.

The fifth principle is revolutionary and, in the opinion of the commission, a retrograde step. Miss Kenny holds that there are physical, psychologic and physiologic reasons against immobilization; but neither her arguments nor the results achieved by her method were sufficient to induce the commission to concede that immobilization should be abandoned. Without the application of some apparatus to support weak against normal muscles, deformities due to stretching and contracture are expected. Under the Kenny method such deformities have been observed not as frequently as might have been thought. This is due, probably, to the frequency with which the daily joint movements are performed, which frequency of movement would be impracticable in orthopedic departments of most general public hospitals. Also, even such frequent attention would not prevent the development of severe deformities in spinal and abdominal pareses if splinting was abandoned. Again also the Kenny method, by its avoidance of splinting, would encourage more deformities than orthodox methods in those cases in which the condition has not been cured when it is necessary for the patient to leave the clinic.

One other essential difference of Miss Kenny's method is her treatment of acute cases. Whereas an orthopedic surgeon does not commence joint movement until all pain and tenderness have disappeared, Miss Kenny puts all joints through some range of movement at least once a day in the stage of tenderness. Here the commission stresses the point that muscle damage is only secondary to that caused by the virus at the real sites of the disease (in the nervous tissue) and that early treatment of the muscles cannot possibly minimize the actual paralysis.

The exercises described for training of individual muscles and of muscle groups are very much the same as those used in orthodox practice. The commission draws attention to one fault in Miss Kenny's book; viz., there is no instruction to avoid lengthening of weak muscle fibers. The Kenny method involves the use of hot and cold sprays intended to improve the circulation in affected limbs. This is beneficial in the same way as radiant heat, diathermy and massage. The commission commends the use in orthodox practice of certain of Miss Kenny's apparatus—her pulleys for treatment of spinal curvature and extensor pareses, and her apparatus for measuring power of thrust in the lower limbs. With regard to treatment of spastic paralysis, Miss Kenny's method differs little from orthodox methods. Her patients, however, have had the advantage of more intensive and regular reeducation than is generally possible in clinics of public hospitals and therefore would be expected to have shown greater improvement than most such cases do. Given similar facilities for all patients, no difference in results could be expected. In connection with birth palsy, all references to the reeducative treatment of poliomyelitis apply exactly to that of birth palsy, with even more stress on the necessity of proper splinting.

Miss Kenny has certainly had some measure of success, but it is considered that this is due to the intensity rather than to the nature of the treatment. She has been liberally supplied with funds and the commission considers that, given the same intensity of treatment, orthodox methods would produce better results. Also Miss Kenny's strong personality and her own conviction of technical competence have led many people, in spite of facts to the contrary, to believe in the possibility of cure or improvement.

Much publicity has been given to the whole subject in the daily press, and Miss Kenny must be given credit for having drawn attention to the subject of crippled children and for her effort to secure organized treatment of cripples. On the other hand, it is felt that an exaggerated status has been given to infantile paralysis by popular opinion and that there are many other types of cripples, equally deserving of government help and care, who may derive greater and more permanent benefit from an equal expenditure of public money.

The Australasian College of Physicians

The natural development of the Association of Physicians of Australasia, a private but enthusiastically conducted society with restricted membership, is the basis of the formation of an Australasian College of Physicians, the legal incorporation of which is now in its final stages. The college headquarters will be situated in Sydney, and a property has been acquired in Macquarie Street in the medical quarter of the city. The college will be an examining body and will provide a uniform higher qualification in medicine for practitioners in Australia and New Zealand. At the present time the requirements for doctorates in medicine in the Universities of Australia and New Zealand are by no means uniform and there seems to be little chance of obtaining uniformity. With the time not far distant when every member of the staff of a large hospital will be required to have a higher qualification in the special branch of medicine that he proposes to practice, the college not only will act as a stimulus for the attainment of higher degrees but will indirectly raise the standard of the practice of internal medicine, particularly in institutions. It is anticipated that the college will carry on the tradition of the Association of Physicians in the advancement of internal medicine and the promotion of friendship among physicians.

Sir Frederick Truby King

With the death in New Zealand of Sir Frederick Truby King, one of the greatest figures in the history of child welfare passes. Inspired by the falling birth rate and appalling infant mortality, the child welfare movement had its beginnings in France in the last decade of the last century. America and England followed suit, but it was not till 1905 that any regular inspection of babies and advice to mothers was instituted. On the other side of the world in New Zealand, Dr. Truby King was independently developing a scheme for the care and feeding of babies which was to revolutionize infant life in that country, so that its statistics have for some years now been a challenge to the whole world. Local interest in the truly remarkable work of Sir Truby King was so great that Mr. Harris offered his own home "Karitane" in Dunedin as a home for the care and treatment of babies and the training of nurses in the Truby King system. In 1907 under the patronage of Lady Plunkett, wife of the governor of New Zealand, the Plunkett system of training nurses was inaugurated, and from this small beginning has grown a world wide movement and Karitane, Dunedin, became the Mecca of nurses wishing to study maternal and infant welfare.

It was in the control of gastro-enteritis that Sir Truby achieved his most signal success. In Dunedin the death rate from infantile diarrhea dropped from 25 per thousand in 1907 to less than 1 per thousand in 1922. Over the same period the tally in Christchurch was reduced from 45 to 2. It has been argued that New Zealand enjoys some special immunity owing to some unusual geographic and climatic conditions. The main

110
938

contention is that an equable and moderate temperature operates in favor of the dominion, but this theory is given pause by the fact that the death rate among young children is and has been lower in tropical Queensland than in Tasmania. Sir Truby King was the pioneer of the syndicated health bulletin. At regular intervals he caused to be published in every newspaper of the dominion a simple talk on wise ways in mothercraft.

Born at New Plymouth, New Zealand, Frederick Truby King took the degrees of M.B. and B.Sc. at Edinburgh University, where he was an Eccles scholar. He was director of child welfare for New Zealand from 1921 to 1927 and Inspector General of Mental Hospitals and a member of the Prisons Board from 1925 to 1927. He founded the Royal New Zealand Society for the Health of Women and Children, known as the Plunket Society, in 1907, and later was lent by the New Zealand government to organize a babies' hospital and mothers' center in England. Sir Frederick's first interest in baby welfare was developed through his successful work among dairy calves on the thousand acre farm belonging to the Mental Hospital, of which he was then superintendent. There he instituted a system of "rational, scientific, artificial feeding" for the calves, based on the percentage composition (and especially the protein ratio) of average cow's milk. As a result of this perfected feeding, mortality from "scouring" among the calves was completely eliminated. The applications of the same principles of percentage feeding to babies reduced mortality from diarrhea to almost nothing in New Zealand. For three successive years not one baby up to the age of 2 years died from any form of this disease in Dunedin, the home of the first Karitane Home. So impressed was Dr. King with the results of his experiments with calves that when a distressed mother brought her baby to him he agreed to take the child into his own home and treat it on the same principles that had proved so successful with calves, taking human milk as his model instead of cow's milk. He and Lady King looked after the baby themselves, and it throve so remarkably that they were soon caring for other undernourished babies. Their fame spread, and they were forced to take a cottage near by to accommodate the numbers of babies applying for admission to their care. Lady King could not cope with the work involved, but it was impossible in those days to obtain the services of trained nurses easily, and the help of untrained women had to be employed, often with disastrous results. Sir Frederick's work was recognized by a C.M.G. in 1917 and a knighthood in 1925. But surpassing both these is the international scientific recognition of his work and the fact that his name is a household word in Australasia.

Marriages

WILLIAM DEAN MOHLENBROCK, Murphysboro, Ill., to Miss Katherine Louise Weinberg of DuQuoin, Dec. 18, 1937.

MAX KNOWLES MOULDER, Nashville, Tenn., to Miss Frances Cooley Bell at Rockville, Md., January 1.

JOHN JOSEPH CHELEDEN, Philadelphia, to Miss Mary Mercur Roberts of Southampton, Pa., January 18.

DAVID H. MORTON to Miss Dorothy Lucille Young, both of Elmwood, Ill., in Peoria, Dec. 23, 1937.

BEN HAGAN MARSHALL, Fayetteville, Tenn., to Miss Mary Sue Cooper of Cadiz, Ky., Dec. 22, 1937.

JOHN WESLEY PLOWMAN to Miss Jane E. Moore, both of Harrisburg, Pa., January 15.

OTTO J. LIBENER, Hazleton, Pa., to Miss Eleanor M. Riillo of Philadelphia, Nov. 10, 1937.

JOSEPH HERMAN MEADOWS, Fairmont, N. C., to Miss Leora Mae Compton, Dec. 21, 1937.

JACOB L. FRITZ to Miss Catherine Cranford, both of Asheboro, N. C., January 16.

ROBERT EDWARD POU to Miss Selma Anderson, both of New York, January 12.

Deaths

Edmund Dougan Clark ✠ Indianapolis; Bellevue Hospital Medical College, New York, 1891; member of the House of Delegates of the American Medical Association in 1907; secretary and professor of surgery, Indiana University School of Medicine; past president of the Indiana State Medical Association, Indianapolis Medical Society and the Marion County Medical Society; member of the American Surgical Association, Southern Surgical Association and the Western Surgical Association; fellow of the American College of Surgeons; served during the World War; consulting surgeon to the Indianapolis City Hospital; on the staffs of the Coleman Hospital for Women, Robert W. Long and Methodist hospitals and the James Whitcomb Riley Hospital for Children; aged 68; died, February 16, of pneumonia.

George Murray Waters ✠ Columbus, Ohio; Bellevue Hospital Medical College, New York, 1881; professor of physiology and physiological anatomy, Columbus Medical College, 1883-1890; professor of principles and practice of medicine and nervous diseases, Ohio Medical University, 1893-1907, and dean, 1896-1907; professor of principles and practice of medicine and nervous diseases and dean, Starling-Ohio Medical College, 1908-1909; on the staff of the White Cross Hospital; aged 78; died, January 22, of pneumonia.

Thomas Barnes Futcher ✠ Baltimore; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1893; associate professor of medicine, Johns Hopkins University School of Medicine; member and past president of the Association of American Physicians; fellow of the American College of Physicians; served during the World War; on the staff of the Johns Hopkins Hospital and the Johns Hopkins Dispensary; aged 66; died suddenly, February 25, of coronary occlusion and arteriosclerosis.

Raleigh Russell Huggins ✠ Pittsburgh; Miami Medical College, Cincinnati, 1891; dean and professor of gynecology at the University of Pittsburgh School of Medicine; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Gynecological Society; fellow of the American College of Surgeons; medical director of the Elizabeth Steel Magee Hospital and on the staff of St. Francis Hospital; aged 67; died, February 20, of cerebral hemorrhage.

Frank William Porterfield, Waterloo, Iowa; Chicago Medical College, 1879; member of the Iowa State Medical Society; fellow of the American College of Surgeons; on the staffs of the Allen Memorial, St. Francis and Presbyterian hospitals; division surgeon to the Illinois Central Railroad; examining surgeon to the United States Compensation Bureau; aged 75; died, Dec. 21, 1937, in the Illinois Central Hospital, Chicago, of pneumonia, following uremia.

John T. Rogers ✠ St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1891; associate professor of surgery at the University of Minnesota Graduate School of Medicine, Minneapolis; fellow of the American College of Surgeons; past president of the Minnesota State Medical Association and the Ramsey County Medical Society; chief and president of the staff of the Charles T. Miller Hospital; aged 70; died, January 2.

Louis Clausen Schroeder ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1911; assistant professor of clinical pediatrics at the Cornell University Medical College; member of the American Pediatric Society and the American Academy of Pediatrics; aged 56; attending pediatrician to the New York Hospital, where he died, February 25, of hypertensive vascular disease and arteriosclerosis.

Frank Bradley Cross ✠ Cincinnati; Miami Medical College, Cincinnati, 1895; formerly secretary and assistant professor of ophthalmology at the University of Cincinnati College of Medicine; fellow of the American College of Surgeons; on the staff of the Cincinnati General Hospital; medical director of the Columbia Life Insurance Company; associate editor of the *Journal of Medicine;* aged 66; died, February 7.

James Farquharson Leys ✠ Medical Director, Vice Admiral, U. S. Navy, retired, Bryn Mawr, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; entered the navy in 1893 and retired in 1932; served during the Spanish-American and World wars; fellow of the American College of Surgeons; aged 70; died, January 12, in the U. S. Naval Hospital, Philadelphia, of pneumonia.

Julius Heyward Taylor, Columbia, S. C.; University of Virginia Department of Medicine, Charlottesville, 1901; past president of the South Carolina Medical Association; member

V 1
193

and formerly treasurer of the Southern Surgical Association; at one time member of the state board of medical examiners; fellow of the American College of Surgeons; surgeon to the Columbia and Baptist hospitals; aged 60; died, January 31.

George Leslie Strader ✠ Cheyenne, Wyo.; University of Nebraska College of Medicine, Omaha, 1899; in 1908 member of the House of Delegates of the American Medical Association; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staff of the Memorial Hospital; aged 67; died, January 21, in Claremont, Calif., of cerebral hemorrhage.

Thomas Cook Smith ✠ Louisville, Ky.; Johns Hopkins University School of Medicine, Baltimore, 1922; associate clinical professor of pediatrics, University of Louisville School of Medicine; member of the American Academy of Pediatrics; fellow of the American College of Physicians; on the staff of the Norton Memorial Infirmary; aged 41; died, Dec. 14, 1937, in St. Joseph Infirmary.

Edward Everett Evans ✠ Chicago; Detroit College of Medicine, 1900; past president and secretary of the Lake County (Ind.) Medical Society; formerly on the staffs of the Mercy and Methodist hospitals, Gary, Ind.; at one time coroner of Lake County, Ind.; aged 62; died, Dec. 5, 1937, of carcinoma of the prostate, metastatic spinal carcinomatosis, urinary retention and sepsis.

Charles Morton Smith ✠ Boston; Harvard University Medical School, Boston, 1894; clinical professor of syphilology emeritus at his alma mater and at the graduate school; member and past president of the American Dermatological Association; member of the New England Dermatological Society; aged 70; died suddenly, January 8, of coronary thrombosis.

Anatole Raoul Trahan ✠ Lafayette, La.; Tulane University of Louisiana Medical Department, New Orleans, 1892; past president of the Lafayette Parish Medical Society; served during the World War; at one time mayor and parish coroner; on the staff of St. John Hospital; aged 67; died, Dec. 2, 1937, of cerebral hemorrhage and arterial hypertension.

Walter Richard Wallace, Memphis, Tenn.; College of Physicians and Surgeons, Memphis, 1908; member of the Tennessee State Medical Association; formerly assistant professor of psychiatry at the University of Tennessee College of Medicine; part owner and president of the Wallace Sanitarium; aged 58; died, Dec. 13, 1937, of coronary thrombosis.

J. William Scales ✠ Pine Bluff, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; served during the World War; aged 73; died, Dec. 4, 1937, of coronary thrombosis.

Stephen Earle Vosburgh ✠ Pownal, Maine; Jefferson Medical College of Philadelphia, 1905; member of the American Psychiatric Association and the New England Society of Psychiatry; medical superintendent of the Pownal State School; aged 56; died, Dec. 24, 1937, of coronary occlusion.

James Robert Vann, Abbeville, Ala.; Medical College of Alabama, Mobile, 1899; member of the Medical Association of the State of Alabama; formerly member of the state legislature; aged 66; died, Dec. 16, 1937, in a hospital at Dothan, of acute cystitis, diabetes mellitus and pyelonephritis.

Norman Philip Geis, Riverside, Conn.; Long Island College Hospital, Brooklyn, 1896; formerly lecturer in anatomy and instructor of obstetrics and gynecology at his alma mater; at one time on the staff of the Swedish Hospital, Brooklyn; aged 63; died, February 5, in New York.

Paul Russell Stetson, New Haven, Conn.; Yale University School of Medicine, New Haven, 1902; member of the Connecticut State Medical Society; on the staff of the Grace Hospital; aged 59; died, Dec. 7, 1937, of cerebral accident from hypertension and edema of the lungs.

John Schee ✠ Westby, Wis.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; at various times county health officer, member of the Westby school board and county board of education; aged 75; died, Dec. 16, 1937, of coronary occlusion.

Joseph Seymour Tennen ✠ Stamford, Conn.; University and Bellevue Hospital Medical College, New York, 1920; member of the Radiological Society of North America; aged 43; died, Dec. 12, 1937, in the University Hospital, Ann Arbor, Mich., of coronary occlusion.

Albert John Pullen ✠ Fond du Lac, Wis.; University of the South Medical Department, Sewanee, Tenn., 1898; formerly state senator; served during the World War; at one time bank president; aged 74; died, Dec. 6, 1937, in St. Agnes Hospital, of coronary occlusion.

Forrest Wiley Pike, Stoneham, Mass.; University of Vermont College of Medicine, Burlington, 1890; member of the Massachusetts Medical Society; aged 75; died, Dec. 31, 1937, in the New England Sanitarium and Hospital, Melrose, of cerebral hemorrhage.

Loyal Wilbur Wilson ✠ New Castle, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1891; fellow of the American College of Surgeons; on the staff of the Jameson Memorial Hospital; aged 71; died, Dec. 27, 1937, of coronary thrombosis.

Christen Quevli Sr., Tacoma, Wash.; Minnesota Hospital College, Minneapolis, 1885; past president and vice president of the state tuberculosis association; served during the World War; aged 73; died, Dec. 1, 1937, in Seattle, of lobar pneumonia.

Floyd G. Rifenberg, Gaylord, Mich.; Detroit College of Medicine and Surgery, 1928; member of the Michigan State Medical Society; served during the World War; aged 41; died, Dec. 19, 1937, in the Mercy Hospital, Grayling, of heart disease.

Frank W. Milward ✠ Lakewood, Ohio; Tufts College Medical School, Boston, 1919; fellow of the American College of Surgeons; formerly on the staff of St. John's Hospital, Cleveland; aged 45; died suddenly, Dec. 25, 1937, in Rocky River.

Wellington Clarence Van Wormer, Homewood, Ill.; St. Louis University School of Medicine, 1910; member of the state department of health; aged 51; died, Dec. 13, 1937, in the Ingalls Memorial Hospital, Harvey, of cardiovascular renal disease.

Howard Alfred Baynton, Bradford, Pa.; Northwestern University Medical School, Chicago, 1931; member of the Medical Society of the State of Pennsylvania; aged 32; on the staff of the Bradford Hospital, where he died, Nov. 15, 1937.

Willis P. Weaver, Lockport, N. Y.; Hahnemann Medical College of Philadelphia, 1883; member of the Medical Society of the State of New York; aged 84; died, Dec. 26, 1937, of carcinoma of the bladder and pulmonary embolism.

William Essex Whitson ✠ Washington, D. C.; Columbian University Medical Department, Washington, 1898; served during the World War; aged 63; died, Dec. 3, 1937, in the George Washington University Hospital, of heart disease.

Charles Henry Robinson, Columbus, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1937; aged 27; intern at the White Cross Hospital, where he died, Dec. 10, 1937, of cerebrospinal meningitis and pneumonia.

Herbert Eugene Rowe, Newton, N. C.; North Carolina Medical College, Davidson, 1905; served during the World War; aged 55; died, Dec. 11, 1937, in a hospital at Statesville, of injuries received in an automobile accident.

Joseph S. Niederkorn, Versailles, Ohio; Eclectic Medical Institute, Cincinnati, 1887; member of the Ohio State Medical Association; formerly mayor of Versailles; aged 71; died suddenly, Dec. 28, 1937, of coronary thrombosis.

Edwin A. Sevringhaus, New Albany, Ind.; Louisville (Ky.) Medical College, 1890; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 69; died, Dec. 13, 1937, in St. Edward's Hospital, of cerebral hemorrhage.

Ernest Miller Swift Jr., Louisville, Ky.; University of Louisville School of Medicine, 1937; intern at the Kentucky Baptist Hospital; aged 25; died, Dec. 8, 1937, in the City Hospital, of Streptococcus viridans infection.

John Henry Eugene Sand, Brooklyn; University of the City of New York Medical Department, 1886; aged 76; died, Dec. 2, 1937, in the Nathan Littauer Hospital, Gloversville, of angina pectoris and chronic myocarditis.

Carl Gustav Larson, Medford, Mass.; College of Physicians and Surgeons, Boston, 1927; member of the Massachusetts Medical Society; aged 42; died, Dec. 23, 1937, of heart disease and acute pulmonary edema.

Leonard C. Schulze ✠ Chicago; Dearborn Medical College, Chicago, 1905; aged 65; member of the board of directors and on the staff of the Garfield Hospital, where he died, Dec. 12, 1937, of aneurysm of the aorta.

Henry Landalynn Trenkle ✠ Portville, N. Y.; Minneapolis College of Physicians and Surgeons, 1909; member of the American Psychiatric Association; aged 63; died, Dec. 4, 1937, of carcinoma of the esophagus.

T. C. Gaboury, Montreal, Que., Canada; School of Medicine and Surgery, Montreal, 1873; formerly member of the legislature of Quebec and mayor of Bryson; aged 86; died, Dec. 28, 1937, of pneumonia.

Francis Theodore Rollins ✠ Fox Lake, Ill.; Chicago College of Medicine and Surgery, 1916; served during the World War; aged 53; died, Dec. 22, 1937, at St. Therese's Hospital, Waukegan, of pneumonia.

Edward R. Roderick, Wilkes-Barre, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; aged 65; died, Dec. 21, 1937, in the Wilkes-Barre General Hospital, of intestinal obstruction.

William Golford Robertson, Warren, Pa.; University of Buffalo School of Medicine, 1935; member of the Medical Society of the State of Pennsylvania; aged 30; died, Dec. 27, 1937, of cerebral emboli.

Henry Schmid, New York; University of the City of New York Medical Department, New York, 1895; aged 80; died, Dec. 19, 1937, in Baldwin, N. Y., of injuries received when struck by a motorcycle.

Virgil Morrison, Atchison, Kan.; Ensworth Medical College, St. Joseph, Mo., 1905; member of the Kansas Medical Society; aged 55; died, Dec. 17, 1937, in Los Angeles, of arteriosclerotic heart disease.

John H. Gerhardt, Sunbury, Ohio; Columbus Medical College, 1882; member of the Ohio State Medical Association; member of the county board of health; aged 79; died, Dec. 30, 1937, of heart disease.

Charles E. F. Streutker ✦ St. Louis; Missouri Medical College, St. Louis, 1895; on the staff of the Alexian Brothers' Hospital; aged 64; died, Dec. 29, 1937, in St. Anthony's Hospital, of pneumonia.

Julius E. Sommerfield ✦ Atlanta, Ga.; Medical College of Ohio, Cincinnati, 1886; on the staffs of the Piedmont Hospital and Grady Hospital; aged 72; died, Dec. 14, 1937, of coronary thrombosis.

Millard Fillmore Thompson ✦ Washington, D. C.; Columbian University Medical Department, Washington, 1884; aged 80; died, Dec. 26, 1937, of arterial hypertension and chronic nephritis.

David Lafayette Snyder, Philadelphia; Hahnemann Medical College of Philadelphia, 1878; aged 81; died, Dec. 31, 1937, of cardiac decompensation, pulmonary edema and chronic myocarditis.

James Stephen H. Potter, Baltimore; Eclectic Medical Institute, Cincinnati, 1894; Pulte Medical College, Cincinnati, 1895; aged 69; died, Dec. 28, 1937, of carcinoma of the prostate.

Frank N. Saville, Springfield, Mo.; Nebraska College of Medicine, Lincoln, 1909; member of the Missouri State Medical Association; aged 62; died, Dec. 12, 1937, of pernicious anemia.

Ralph Allen Wilcox ✦ Phoenix, N. Y.; Syracuse University College of Medicine, 1899; aged 63; drowned, Dec. 7, 1937, when his car plunged over an embankment into the river.

Charles Albert Reger, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1886; aged 75; died, Dec. 17, 1937, of chronic myocarditis and prostatic hypertrophy.

Samuel H. Woods, Winter Haven, Fla.; University Medical College of Kansas City, Mo., 1895; also a pharmacist; aged 75; died, Dec. 27, 1937, of an injury received in a fall.

William Isidore Wallach, New Rochelle, N. Y.; Cornell University Medical College, New York, 1906; aged 55; died, Dec. 30, 1937, of arteriosclerosis and coronary occlusion.

Grant L. Taylor, Mount Vernon, Ill.; Barnes Medical College, St. Louis, 1895; county coroner; aged 69; died, Dec. 28, 1937, of pneumonia, due to an injury received in a fall.

Wilber Maurice Swett, San Francisco; Cooper Medical College, San Francisco, 1892; aged 71; was killed, Dec. 26, 1937, when his automobile went over an embankment.

Theodore Miles Wittkamp, Cincinnati; Medical College of Ohio, Cincinnati, 1902; aged 59; died, Dec. 19, 1937, in the Jewish Hospital, of arteriosclerosis and hypertension.

Peter Stevens Smigel ✦ Cleveland; Western Reserve University Medical Department, Cleveland, 1894; aged 65; died, Dec. 2, 1937, in Independence, Ohio, of carcinoma.

Jacob Lorenz, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1894; aged 68; died, Dec. 19, 1937, of carcinoma of the liver and hypostatic pneumonia.

Edward W. Parker, Pasadena, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1876; Civil War veteran; aged 92; died, Dec. 26, 1937, of cerebral thrombosis.

John Perkins Russell, Springfield, Mass. (licensed in Massachusetts under the Act of 1894); aged 86; died, Dec. 19, 1937, in the Springfield Hospital, of heart disease.

Henry Arthur Stone, Philadelphia; Temple University School of Medicine, Philadelphia, 1921; also a dentist; aged 42; died, Dec. 22, 1937, of multiple sclerosis.

Charles Austin Willett, Norwalk, Iowa; Drake University Medical Department, Des Moines, 1902; aged 61; died, Dec. 29, 1937, probably of coronary thrombosis.

Hugh Tamisiea, Missouri Valley, Iowa; State University of Iowa College of Medicine, Iowa City, 1902; aged 61; died, Dec. 18, 1937, of coronary thrombosis.

John F. Pearce, Albuquerque, N. M.; Jefferson Medical College of Philadelphia, 1883; aged 77; died Dec. 13, 1937, of heart disease and chronic nephritis.

Rupert Lyle Turrell, Cleveland; University of the City of New York Medical Department, 1892; aged 73; died, Dec. 19, 1937, of carcinoma of the bladder.

John Andrew B. Word, Clarksville, Tenn.; University of the City of New York Medical Department, 1891; aged 75; died, Dec. 15, 1937, of pneumonia.

William M. Allison, Conway, Ark.; St. Louis Eclectic Medical College, 1876; Civil War veteran; aged 96; died, Dec. 19, 1937, of hypostatic pneumonia.

Thomas Joseph Ryan, New York; Fordham University School of Medicine, New York, 1914; aged 51; died, Dec. 17, 1937, of carcinoma of the colon.

Emerson Carter, Bringhurst, Ind.; Physio-Medical College of Indiana, Indianapolis, 1909; aged 53; was killed, Dec. 29, 1937, when struck by a train.

John T. Cass, Fitzgerald, Ga.; University of the City of New York Medical Department, 1887; aged 86; died, Dec. 8, 1937, of cerebral hemorrhage.

Donovan Penheiter, Bagley, Minn.; Northwestern University Medical School, Chicago, 1937; aged 26; died, Nov. 27, 1937, of cerebral hemorrhage.

Franklin Gordon, Morrilton, Ark.; Louisville (Ky.) Medical College, 1874; Confederate veteran; formerly postmaster; aged 84; died, Nov. 30, 1937.

Frank Lee Klopfenstein ✦ Toledo, Ohio; Toledo Medical College, 1910; aged 66; died, Dec. 13, 1937, of coronary thrombosis and arteriosclerosis.

Richard Hutchins Whelpley, New York; Cornell University Medical College, New York, 1937; aged 27; died, Dec. 9, 1937, in a local hospital.

Frank Howard Stewart, Kimball, S. D.; Sioux City (Iowa) College of Medicine, 1902; aged 61; died, Dec. 2, 1937, of coronary thrombosis.

William J. Rouse, Ambler, Pa.; College of Medicine and Surgery, Chicago, 1900; aged 67; died, Dec. 19, 1937, of cirrhosis of the liver.

Elmer Ellsworth Robbins, New Bedford, Mass.; Baltimore Medical College, 1896; aged 76; died, Dec. 21, 1937, of bronchopneumonia.

Catherine Vickers, Cleveland; Ohio Medical University, Columbus, 1898; aged 74; died, Nov. 24, 1937, at Bay Village, of heart disease.

Shelby D. Winstead, Rineyville, Ky.; University of Louisville Medical Department, 1891; aged 71; died, Dec. 23, 1937, of heart disease.

Jacob Sylvanus Rinehart, Flora, Ind.; Eclectic Medical Institute, Cincinnati, 1903; aged 58; died, Dec. 2, 1937, of pernicious anemia.

William Speer Stone, Benton, Ky.; University of Louisville Medical Department, 1888; aged 75; died, Dec. 2, 1937, of myocarditis.

Norman Joseph Kilbourne ✦ Los Angeles; Rush Medical College, Chicago, 1924; aged 47; died, January 16, of coronary thrombosis.

Fred Bacharach, Los Angeles; Medical College of Ohio, Cincinnati, 1886; aged 72; died, Nov. 3, 1937, of coronary sclerosis.

Richard M. Southard, Fort Smith, Ark.; University of Louisville (Ky.) Medical Department, 1887; aged 72; died, Nov. 2, 1937.

Jacob Wilson Seip, Erie, Pa.; Jefferson Medical College of Philadelphia, 1883; aged 77; died, Dec. 28, 1937, of myocarditis.

James John Rose, Marshall, Ill.; Chicago Homeopathic Medical College, 1896; aged 74; died, Dec. 18, 1937, of pneumonia.

James Lester Wright, Yantis, Texas; Memphis (Tenn.) Hospital Medical College, 1905; aged 60; died, Nov. 18, 1937.

Guy Harold Sumrell, Ayden, N. C.; Medical College of Virginia, Richmond, 1915; aged 45; died, Nov. 20, 1937.

George B. Broadway, Delhi, La.; Chattanooga (Tenn.) Medical College, 1901; aged 60; died, Dec. 2, 1937.

David S. Neer, Vinita, Okla.; Albany (N. Y.) Medical College, 1875; aged 85; died, Nov. 14, 1937.

V 1
193

Correspondence

ACTION ON RAPPLEYE PROPOSAL

To the Editor:—In an editorial in THE JOURNAL, February 26, page 654, it is stated that "the executive body of the Association of American Medical Colleges promptly expressed its approval of the measure in a special session and endeavors were made to obtain endorsement from the Federation of State Medical Licensing Boards and other bodies in convention at the same time as the Annual Congress on Medical Education and Licensure." This is a misstatement.

The executive council of this association did meet in a regular session. Dr. Rappleye's proposal was not discussed or even mentioned. The council was not aware that Dr. Rappleye intended to make his proposal. Therefore, it was not possible to "express approval" or disapproval.

As had been done in 1937, the president of the association called a conference of representatives of various organizations interested in medical education for the purpose of discussing problems of mutual interest. At this conference Dr. Rappleye presented his proposal. It was discussed at great length but this group could not take action on any topic discussed, nor could any topic be referred to any of the groups represented at the meeting for future action. True, any one present could bring up anything discussed before his organization but without obligation to the conference, which was entirely a voluntary affair and merely a sort of clearing house for free discussion.

FRED C. ZAPFFE, M.D., Chicago.
Secretary, Association of American Medical Colleges.

CONVULSIONS DURING INSULIN THERAPY IN THE PSYCHOSES

To the Editor:—Cameron and Hoskins (THE JOURNAL, Oct. 16, 1937, p. 1246) say "we consider that when convulsions occur treatment should be terminated immediately by means of intravenous sugar." Epileptiform attacks during the course of insulin treatment in schizophrenia have occasioned various reactions among different investigators. Sakel himself stated that he tried to avoid convulsions. Rymer, Benjamin and Ebaugh (THE JOURNAL, Oct. 16, 1937, p. 1249) state that their results indicate that "convulsions did not interfere with good therapeutic results." Wortis (THE JOURNAL, Oct. 30, 1937, p. 1470) writes that "some recognize convulsions as not only harmless but even beneficial." He also points out that although Sakel considers the convulsive reactions as "heavy artillery" and prefers to use "light artillery," nevertheless he recognizes that favorable effects sometimes follow major seizures. On the whole the actual status of convulsive reactions in the treatment is still uncertain.

Successes with the convulsant therapy of Meduna have already led to a more favorable attitude toward insulin seizures. According to Grayzel (*Arch. Int. Med.* **54**:694 [Nov.] 1934) similar paroxysms in rabbits cause cerebral damage. When no convulsions followed insulin injections there were no microscopic histopathologic changes in the brain; after slight convulsions there were minimal or no brain changes; after one or more severe convulsions there were definite anatomic lesions. The greater the number and the more prolonged the convulsions the more severe were the lesions; among other changes there were small zones of focal necrosis in the cerebral cortex. The dose of insulin was comparable to that now used in schizophrenia. Therefore convulsant reactions with insulin should preferably be avoided. What bearing these histopathologic observations have on convulsant therapy with camphor or metrazol can only be a matter of conjecture. The question is worthy of further study.

When convulsions occur in the course of insulin therapy, one wonders whether intravenous injection of dextrose is urgent. During hypoglycemic convulsions, resulting from either insulin injection or spontaneous hyperinsulinism, I have noted, as have many others, that the blood sugar rises to normal levels. In fact the conversion of muscle glycogen into dextrose during a seizure is considered by some investigators to be a homeostatic mechanism. Whether or not the rise in blood sugar is sufficient in all instances to neutralize the effects of the hypoglycemia at the time, or how long the normal blood sugar level, if attained, persists, we cannot say. For these purposes it may, perhaps, still be necessary to supply extraneous dextrose orally but probably not intravenously. Further observation of the post-convulsive rise in blood sugar to determine its frequency, degree and duration is desirable.

EUGENE ZISKIND, M.D., Los Angeles.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CORRECTION: TREATMENT OF CHOREA

In the answer in Queries and Minor Notes (THE JOURNAL February 26, p. 676) in the second paragraph there is a rather important error with regard to the dosage of the soluble barbital derivatives. The statement "Sodium amytal from 1 to 2 Gm. or pentobarbital sodium from 0.065 to 1 Gm. should be given orally as often as necessary to control the patient. Sodium amytal may be given intramuscularly in doses of 0.13 or 2 Gm. . . ." should be corrected to read as follows: "Sodium amytal from 1 to 2 grains (0.065-0.13 Gm.) or pentobarbital sodium 1 grain (0.065 Gm.) should be given orally as often as is necessary to control the patient. Sodium amytal may be given intramuscularly in doses of 0.13 Gm. (2 grains) . . ."

EPINEPHRINE IN GENERAL ANESTHESIA—ANESTHESIA FOLLOWING COCAINE LOCALLY

To the Editor:—Is there any contraindication to the use of epinephrine during chloroform or ether anesthesia? Is general anesthesia contraindicated following the topical administration of cocaine? If so, what is the rationale of each? Please give references if possible.

M.D., Louisiana.

ANSWER.—The effect of epinephrine during anesthesia has been studied by many investigators and from many points of view. Experimentally, G. A. Emerson (Action of Inhalation Anesthetics on Dehydrogenases, *Current Res. Anesth. & Analg.* **15**:134 [May-June] 1936) noted that lactic acid dehydrogenase of brain tissue is not inactivated by the common inhalation anesthetics. The stimulation of epinephrine secretion by the anesthetic may account for the glycogenolytic activity. No inactivation of luciferase of a lampyrid occurs at anesthetic or sublethal concentrations of inhalation anesthetics. A. G. Levy and Thomas Lewis (Heart Irregularities Resulting from the Inhalation of Low Percentages of Chloroform Vapor and Their Relationship to Ventricular Fibrillation, *Heart* **3**:99, 1911-1912), in experiments on cats, found that "Small intravenous injections of adrenalin chloride produce, under high percentages of chloroform vapor, a condition of irritability in the ventricle, which is similar to that observed to result from low percentages of chloroform alone. Low tensions of chloroform administered to cats together with small intravenous injections of adrenalin chloride ultimately produce the highest grade of ventricular disorder, i. e., ventricular fibrillation." In a later article Levy (A Cardiac Effect of Adrenalin in Chloroform Subjects, *Brit. M. J.* **2**:627 [Sept. 14] 1912) concluded that "it is unsafe to inject adrenalin into the veins or vascular tissues of a patient lightly under the influence of chloroform. It may be safely injected just previous to induction with chloroform—that is, with the patient under no anesthetic at the moment, or in a patient fully under chloroform, or into a patient anesthetized to any degree with ether." In 1914 Levy (Sudden Death Under Light Chloroform Anesthesia, *Proc. Roy. Soc. Med.* **7**:57 [Sect. Anaesth.] 1914) stated that "when the heart is affected by low concentrations of chloroform it is thrown by the action of

adrenalin into a condition known as ventricular fibrillation, but when affected by full concentration such, for instance, as a 2 per cent proportion of vapor to the inhaled air, ventricular fibrillation does not occur. . . . I have never observed death by ventricular fibrillation in cats under ether . . . even very large doses of adrenalin have failed to produce this effect." Clinical experience bears out Levy's experience. J. T. Gwathmey (Anesthesia, ed. 2, New York, Macmillan Company, 1924, p. 373) quoted Delbet, Herrenschmidt and Beauvy (Chloroformisation et capsules surrénales, *Rev. de chir.* **45**:544 [April 10] 1912), who said that "adrenal extracts should be administered to chloroformed subjects, whether the suprarenal capsule shows evidence of weakness or whether it gives evidence of struggle and consequent reaction. The effect of prolonged chloroform administration on the medullary portion of the adrenal is diminution and even disappearance of both chromaffin and adrenalin. Delbet has administered adrenalin to more than 1,000 chloroformed patients. The results have been splendid. He believes that adrenalin unquestionably regularizes the narcosis and diminishes (in most cases eliminates) postoperative shock." Douglas (Action protectrice de l'adrénaline; syncope adrénalino-chloroformique., *Compt. rend. Soc de biol.* **91**:1419 [Dec. 15] 1924) said that intravenous injections of epinephrine during anesthesia produce syncope and death but that injected before chloroform anesthesia epinephrine is innocuous and furthermore offsets the ill effects of an injection of epinephrine given again during anesthesia. It was his opinion that epinephrine produces either a fatal or a protective effect depending on whether it is administered before or during anesthesia. Victor Papillan, Ion Cosma and I. G. Russu (Recherches expérimentales sur la syncope adrénalino-chloroformique, *Compt. rend. Soc. de biol.* **115**:311 [Nov. 23] 1934) found that the administration of from 0.01 to 0.02 mg. of epinephrine per kilogram causes syncope in dogs anesthetized with chloroform but not in those anesthetized with ether. André and Edith Tournade (De l'influence des anesthésignes [éther et chloralose] sur les effets cardio-vascularies de certaines excitations nerveuses, *Compt. rend. Soc. de biol.* **121**:910 [No. 9] 1936) reported that ether paralyzes the secretion of epinephrine and also decreases the sensitivity of the cardiovascular system to epinephrine. Chloralose does neither. This explains the difference in the effects of excitation of the vagus and splanchnic nerves on the arterial pressure in the two cases.

The use of a general anesthetic is not contraindicated following the topical administration of cocaine.

DERMATOMYCOSIS OR DYSHIDROSIS

To the Editor:—A white married woman about 50 years old has had blisters occurring on the soles of her feet at irregular intervals for the past five years. These last about two weeks and disappear. Their presence is accompanied by itching, burning and pain, which necessitates the avoidance of shoes. The blisters vary in size, the largest being about half or three quarters of an inch long or wide. They occur more often in the summer than in the winter. Synchronously with the blisters, which are by far more frequent on the feet than on the hands, there often appear brownish and pinkish papules on the hands (mostly along the outer edge, between the dorsal and palmar surfaces) which are pruritic. The past history seems to be rather irrelevant. Is a diagnosis of dermatitis herpetiformis (vesicular or bullous) indicted? If so, what is the best form of treatment? If not, what would be the correct diagnosis?

SAMUEL BARMAK, M.D., Brighton Beach, N. Y.

ANSWER.—There are two conditions answering the description given: (1) dyshidrosis, a rare disease supposedly of the sweat apparatus, caused, it is conjectured, by nervous or toxic disturbance of internal origin, and (2) dermatomycosis, ringworm infection, which lurks between the toes unnoticed until it flares up with vesicular eruption on the soles, sides of the feet and between the toes, subsiding usually in a week or two.

The latter is much the commoner and should be examined by maceration of the roofs of the vesicles and the scales from between the toes in 10 per cent sodium hydroxide solution. These are examined with the high dry lens at intervals for seventy-two hours, if a positive result is not obtained in a shorter time. The fungi appear as highly refractive spores or mycelia.

The involvement of the hands occurs in both diseases. In the dermatomycosis it is explained as a tricophytid, an eruption due to toxins transported by the blood or to a higher resistance in the tissues of the hands, enabling them to kill off more readily the organisms deposited from the blood.

If the examination for ringworm gives positive results, one of the best ways of subduing the vesicular eruption is the use of potassium permanganate, either in a 1:3,000 solution in water, in which the parts are soaked for half an hour twice a day, or a 1 or 2 per cent paint to be applied once a day and allowed to dry. When this causes uncomfortable dryness, a Whitfield ointment, 5 per cent salicylic acid and 10 per cent benzoic acid in rose water ointment, may be substituted. This should be used daily for about two weeks after the attack has subsided and then applied between the toes once or twice a week after this to prevent recurrence.

The socks should be changed often and boiled or, if of silk, sterilized by chemical means when washed. One may treat the shoes by inserting into each one a piece of blotting paper saturated with strong solution of formaldehyde, wrapping up the shoes as nearly air tight as possible and leaving them for at least a day, and then carefully airing them before using them.

If no fungus is found, the case may be one of the rare dyshidrosis. The treatment is local and general. The patient's nervous system is supposed to be at fault, so attention should be directed to correction of any disorder of this kind that can be found. Tonics, interdiction of tea, coffee, tobacco and alcohol, plenty of outdoor exercise between attacks, and regularity of habits are recommended. Locally, the use of potassium permanganate as for the preceding disorder is excellent to cut short the attack. Between attacks, sponging the feet with 1 per cent salicylic acid in 50 per cent alcohol after the bath, and plentiful use of a simple dusting powder are helpful.

The diagnosis of dyshidrosis cannot be established until a thorough search for fungi has been made. Some authorities doubt the existence of such a disease, considering all these conditions as due to ringworm infection.

Dermatitis herpetiformis is more generalized, the eruption changing its location frequently.

DEAF-MUTISM OR FEEBLEMINDEDNESS IN GIRL

To the Editor:—A girl, aged 8 years, of normal delivery, has always been well and active. She cannot read or write and cannot or will not cooperate in hearing tests, so that it is impossible to determine whether she can hear anything or not. Examinations of the ear, nose and throat give entirely negative results. The eustachian tubes open easily. She has never talked but does call attention to airplanes and can hear an automobile horn, a gun shot or a firecracker behind her. Is this child a deaf mute? Is there some way to find out whether she can hear or not? Should she be put in a school for the deaf or should she get individual training in speaking and interpreting sound?

M.D., West Virginia.

ANSWER.—There are a number of ways of testing a child as to its capacity without the use of language. It must not be forgotten that a child may appear to be deaf, even at the age of 8 years, because the child has found that with a minimum of effort on its part its wants can be attended to. On the other hand, it seems unlikely that, if this child were of normal intelligence, some effort to hear would not have been made by her before the present time. This type of problem is one which calls for the attention of a trained psychologist since the physical examination is negative. It is possible, too, that this child has that peculiar type of deafness described by Ewing, in which the patient is able actually to hear but owing to a defect in certain parts of the tone range the words and meaningful sounds are poorly interpreted. The first thing that should be done with this child before deciding whether she should be put in a school or should get individual training is to give an intelligence test of a performance type which does not require the use of hearing or speech. A local psychologist attached to a mental hygiene clinic could administer such a test. It may be that instead of a school for the deaf this child would require an institution for the feebleminded. Regardless of that fact, if the psychologist finds her to be of normal intelligence, it calls for special work on the part of the physician and a psychologist who would work out a training program for her, and naturally the greater the experience of the psychologist in this work with deaf children the more useful he will be to the physician.

IODIZED OIL IN DIAGNOSIS OF SPINAL TUMORS

To the Editor:—I am interested in the technic of the injection of iodized oil for the diagnosis of tumors in the neurocanal, its indications, limitations and dangers.

GUY E. VAN DEMARK, M.D., Sioux Falls, S. D.

ANSWER.—The technic employed for injecting iodized oil is similar to that employed in carrying out a lumbar puncture. The same sort of needle is used, and after the spinal pressures have been determined and at least 5 cc. of spinal fluid has been withdrawn, a similar quantity of heavy solution of iodized oil is introduced into the spinal canal, through the same needle. The iodized oil is usually made up with some heavy oil; therefore it is important to warm the oil to a temperature of about 102 or 103 F. but never warmer. It is necessary to have the oil warm so that it will flow, but if it is heated to any greater degree than 102 or 103 F. there is danger of irritating the root and giving rise to additional neuritic pain. The indications for

V 1
193

the injection of iodized oil are two: (1) to identify a tumor when neurologic examination is not sufficient and (2) to aid in determining the character of the tumor. Extramedullary tumors situated within the canal usually produce filling defects which are readily demonstrated on fluoroscopic examination and frequently demonstrated on x-ray films. As a rule, injections of iodized oil do not seem indicated when the neurologic observations suggest a definite level and a block in the spinal canal. Iodized oil, then, is of extreme value in assisting in the recognition of small tumors which have not produced cord compression, and it is likewise of value in recognizing and locating the so-called protruded intervertebral disk which so often is the cause of chronic recurring sciatica. In reply to the question on limitations and dangers, iodized oil should not be used indiscriminately, because it does give rise to a low grade meningitis. There is an increase in the cell count, possibly an increase in the proteins in the spinal fluid, as a result of the injections. However, no detrimental effect is observed. Heavy iodized oil rather than the light is preferred, for an iodized oil lighter than the cerebrospinal fluid will ascend and eventually lodge in the subarachnoid spaces and possibly in the ventricle, whereas the heavy oil has a tendency to rest in the caudal site and in a few instances has been removed. Of course it is usually removed when positive observations are demonstrated and a laminectomy is done, because then the iodized oil can be removed through the same laminectomy wound.

DIABETIC COMA WITHOUT GLYCOSURIA—REACTIONS TO CALCIUM INJECTIONS

To the Editor:—1. Can diabetic coma occur in the absence of glycosuria with hyperglycemia present? 2. I observed two reactions from intravenous injections of 10 cc. of 10 per cent calcium gluconate solution in two patients, about twenty-four hours following the injection. The first patient, a woman, aged 31, experienced much restlessness, nervousness, emotional instability, excitability and fatigability twenty-four hours after the injection, which wore off gradually in three days; she also had flashes of hot and cold (no thyroid or menstrual disturbances) and a tight feeling in the epigastrium, with anorexia. The second patient, a woman, aged 43, suffered from a severe continuous headache and an eruption; twenty-four hours after the intravenous injections, she describes the eruption as being papular and itchy, distributed on the face, scalp and buttocks. I did not see the rash. She also had anorexia and heaviness in the epigastrium. This wore off gradually in about six days. Both patients were under treatment for spastic colitis and were getting along well. They also had calcium gluconate intramuscularly without a reaction before the intravenous administration of the drug. Is it possible that these reactions were due to the calcium or was it a coincidence? Is there anything in the literature about calcium reactions? Neither had any reaction from the injection until twenty-four hours later. M.D., New York.

ANSWER.—1. It is possible that diabetic coma with hyperglycemia without glycosuria may occur in patients with marked impairment of renal function.

2. Delayed reactions in patients receiving calcium gluconate intravenously are rarely or never encountered. If a patient with a normal blood calcium is given calcium intravenously, uncomfortable symptoms may follow until the excess calcium is excreted. However, in the foreign literature several reports of delayed reactions have appeared which were attributed to the injection of calcium gluconate and lactate. M. Moschini (*Policlinico* **41**:166 [Feb. 5] 1934) reports that a patient with pulmonary tuberculosis had nausea, vomiting and a chill six hours after the third and fourth intravenous injections of calcium gluconate. After three or four hours these symptoms were followed by prostration, marked asthenia and subfebrile temperature. Moschini found that by combining epinephrine or a camphor with the calcium gluconate he avoided a reaction. A. Alvarez Fernandez (La Medicinana Thera **2**:1 [July 4] 1936) reports three cases in which chills, fever, nausea, vomiting and malaise followed from one to several hours after the administration of calcium gluconate or lactate.

Additional references:

Moschini, M.: Manifestations of Calcium Shock, *Ann. d'ig.* **44**: 798 (Sept.) 1934.

Cornia, L.: Untoward Symptoms Following Intravenous Injection of Calcium Used in Therapy of Pulmonary Tuberculosis, *Gazz. d. osp.* **54**: 959 (July 30) 1933.

Taricoli, I.: Manifestations of Intolerance and Hypoglycemic Syndrome Due to Intravenous Injections of Calcium, *Gior. med. d. Alto-Adige* **5**: 721 (Oct.) 1933.

Coromedi, G., and Guidi, G.: Toxic Accidents Due to Intravenous Therapy: Experimental Study, *Riv. di clin. med.* **35**: 133 (March 15-30) 1934.

Tocco, L.: Causes of Accidents After Intravenous Injections of Calcium, *Riv. d. clin. med.* **30**: 155 (March 15-30) 1935.

Cioffi, E.: Accidents of Intravenous Injections of Calcium, *Morgagni* **77**: 946 (Aug. 25) 1935.

Renda, C.: Febrile Attacks Due to Intravenous Injections, *Gazz. d. osp.* **56**: 292 (March 17) 1935.

Kolesnikov, A. T.: Complications of Intravenous Calcium Therapy, *Vrach delo* **18**: 787, 1935.

Tournaire, A.: Linedoid Dermatitis Following Intramuscular Injection: Mechanism of Reaction, *Bull. Soc. franç. de dermat. et syph.* **43**: 39 (Jan.) 1936.

PSYCHOSIS AND DEATH FOLLOWING TRAUMA IN AGED

To the Editor:—A woman, aged 65, a widow, apparently healthy, had a contusion of the elbow by a fall on a slippery sidewalk. No fracture or other bone change was detected by fluoroscope or film. There was considerable ecchymosis but no great pain and the arm was placed in a sling. Six days after the injury she had a sudden severe profuse hematemesis and was hospitalized. She had a severe hematemesis twenty-four hours later and a slight one forty-eight hours after the first. No further hemorrhage occurred, although there was a laboratory report of slight blood in the stool several days later. There was extreme anemia. Five days after the hemorrhage she developed an acute psychosis. She was given a transfusion but no improvement occurred. She was fed through a nasal catheter for the next four weeks until she died. She had a high fever the last few days. Necropsy failed to reveal any pathologic changes of note in the stomach, esophagus or intestine. A mild gastritis, thought to be due to irration from the tube, was present, but no scars or ulcers of any kind were found. The liver and spleen were practically normal. How could the hemorrhage be accounted for with a lack of pathologic changes at necropsy four weeks later? What connection, if any, could her nervous condition have with the hemorrhage? Can you refer me to literature on this type of case? Could the slight accident have set up the train of symptoms? M.D., Nebraska.

ANSWER.—Psychosis and death from exhaustion not infrequently follow rather trivial injuries in the aged. Rather commonly a fall on the floor at home or a fall on the sidewalk without apparent serious injury will set up a train of psychotic symptoms and terminate in death in just such a manner as described in this case. There are two possible causes, the fall on the sidewalk and the severe hematemesis, both of which probably played a part in precipitating the psychosis.

In view of the blood picture and the results of the necropsy, it seems unlikely that the hematemesis was brought about by the injury or any blood dyscrasia. It seems to have been an unfortunate coincidence that probably helped bring on the psychosis.

Explanation of the hematemesis is more difficult. There can be no doubt that so-called capillary hemorrhage from the stomach may occur. Enormous amounts of blood may be lost in this way and no postmortem evidence be found. Authenticated cases of this type are becoming rarer with better diagnosis and more frequent necropsies. Cases are recorded in which a small ulcer has been found only after serial sections have been made through the gastric mucosa. It is possible that such a situation may have existed here.

It is assumed that there were no ruptured esophageal or gastric varices, that there was no obstruction of the bowel below causing a regurgitation of blood into the stomach, and that the gastritis described could not have been the cause of the hemorrhage. It is not unlikely that a patient in such a mental state may have taken some substance in attempted suicide. Such a substance might produce a gastritis that could conceivably have caused the hemorrhage.

CALCIUM THERAPY IN ASTHMA

To the Editor:—A 9 year old boy has bronchial asthma. He was tested thoroughly and is receiving proper therapy on that basis with only fair results. I should like to institute calcium therapy. Will you kindly suggest a prescription for him? How long should he be kept on calcium? Are there any dangers in excessive or too prolonged calcium treatment? What is your opinion of its efficacy. M.D., New York.

ANSWER.—Calcium preparations may be prescribed orally, intramuscularly or intravenously, but if useful therapeutically in bronchial asthma a form administered by mouth is probably best: tricalcium phosphate 4 Gm. in milk three times daily, calcium lactate 2 Gm. four times daily, or calcium gluconate 4 Gm. four times daily. Calcium compounds may be administered intramuscularly as a 10 per cent sterile solution of calcium gluconate on alternate days for from ten to fifteen doses. It may be administered intravenously as calcium gluconate or chloride, or as solution of "Afenil," which is a molecular compound of calcium chloride and urea. The latter must be slowly injected and not allowed outside the vein. According to Useful Drugs, edition 10, the solutions of the gluconate and the lactate are less irritating than are those of the chloride; hence they are preferable for subcutaneous or intramuscular injection, and even for intravenous injection when there is any danger of the escape of the fluid into the perivascular tissues. Overdosage must be avoided because the intravenous injection of a very large dose may cause death by paralysis of the heart and the central nervous system. A large, but not severely toxic, dose by intravenous injection lengthens the coagulation time of the blood.

No harmful effects have been reported from prolonged calcium therapy. It is felt by some that, if it is of value at all, the best results are to be obtained by administering it indefinitely. The only untoward effects reported are nausea, headache, fever,

110
938

diarrhea, nervousness and a chalky taste in the mouth in sporadic cases; such symptoms call for prompt cessation of the calcium.

Some believe that the administration of from ten to fifteen doses at intervals of from two to ten days without relief of asthma would serve to prove the inefficacy of calcium therapy in a given case. Others hold that, in cases which yield to calcium therapy, calcium, preferably by mouth, should be administered for long periods.

The efficacy of calcium in the treatment of bronchial asthma has probably been overestimated, although it cannot be denied that occasional patients are relieved by its administration. In the majority of patients suffering with bronchial asthma calcium administration has not been of service, but if all other methods have failed the use of calcium is certainly worth a long trial.

CALCULATION OF TIME OF DELIVERY

To the Editor:—Is it possible to calculate from the length of the monthly cycle the time of delivery in those women who carry their children one or two months overtime? M.D., New Jersey.

ANSWER.—Wahl (*Deutsche med. Wchnschr.* **63**:125 [Jan. 22] 1937) studied a series of 9,000 women to determine the length of pregnancy. He found that the average duration of pregnancy was 285 days. This is contrary to prevalent notions based on Naegele's contention that pregnancy lasts on an average of 280 days. Furthermore, Wahl shows that the duration of gestation depends on a woman's menstrual interval. Women with a three weeks menstrual cycle give birth to mature, full term babies earlier than women with a four weeks cycle.

Figures Given by Wahl

Type	No. of Cases	Naegele's Duration of Pregnancy		
Over 35 days	55	291.22		
35	11	295.18	288.17	
30-34	83	284.91		
28 and over	80	288.48		
28	3,382	284.83		284.62
28 or less	61	277.61		
27	7	281.85		
26	18	277.56		
25	26	279.38	277.97	
24	18	278.84		
23	5	281.00		
21	67	277.22		
Under 21	31	277.45		
Irregular	136	284.91		

Wahl quotes G. Veit as having said that a prolonged menstrual interval bespeaks a prolonged pregnancy. Veit cites other authors who report pregnancies which lasted from 296 to 301 days in women who had twenty-nine and thirty day intervals. He also reports authors who observed pregnancies of ten months and more in women who had a five weeks menstrual cycle.

Wahl's figures may be of assistance in determining the probable date of confinement in a given case, but it must be remembered that the actual cause of the onset of labor is still unknown. Other factors than mere fetal size and duration of pregnancy are of importance.

The practical value of the dependence of the duration of pregnancy on the patient's menstrual interval is this: Whereas in women who have a menstrual interval of four weeks or more there is no hurry about inducing labor if they go beyond the supposed end of pregnancy, it may be advisable to terminate pregnancy at the calculated time in women who have a three weeks cycle.

ACUTE APPENDICITIS

To the Editor:—In early acute appendicitis what are the effects of (1) a hot water bag applied to the umbilical region for several hours, (2) a low bicarbonate enema and (3) a teaspoonful of paregoric for two doses for the severe abdominal cramps? Would the pathologic condition in the appendix be much influenced? M.D., New York.

ANSWER.—In the presence of suspected early acute appendicitis, immediate blood and urine examinations should be obtained. In order to minimize the risk to the patient, operation must be performed within the first few hours. In approximately one third of all cases coming to the hospital at the end of twenty-four hours the appendix is ruptured.

A hot water bag applied to the abdomen is in itself harmless, but it may produce a sense of false security or temporary relief and delay the diagnosis and operation.

A rectal examination should always be made. If the rectum contains a considerable amount of fecal material, constipation may be suspected to be the cause of the abdominal distress. A small enema of from 120 to 240 cc. of warm water will usually permit evacuation with relief, but, in case the symptoms are not relieved, immediate steps should be taken to establish the correct diagnosis. There is no objection to adding a small amount of sodium bicarbonate to the enema.

It is an established principle that one should never give a sedative or an opiate to a patient with suspected appendicitis or any other condition in which operative delay might lead to an aggravation of the condition. The symptoms become masked sometimes by simple medication. Certainly, a repeated teaspoonful of camphorated tincture of opium might mask the early symptoms, especially in a child, and delay proper diagnosis in others.

Placing the intestine at rest is helpful in any inflammation of the abdomen. In acute appendicitis, when operation may be impossible or inadvisable because of extensive peritonitis, at the first visit one should stop everything by mouth, avoid cathartics and large or irritating enemas, give fluids parenterally, and under these conditions give adequate doses of morphine.

DIABETES AND TRAVEL

To the Editor:—A patient with diabetes mellitus requiring 80 units of insulin a day is anxious to take a cruise through the West Indies. The trip would take about three weeks. He gets along well, as he is competent in calculating his diet. Do you think there would be any danger in permitting him to make the cruise? I have in mind the possibility that he may become seasick. Kindly advise me at your earliest convenience whether I can safely permit this man to go. He is 45 years old. M.D., New York.

ANSWER.—Any reliable diabetic patient can take a sea voyage safely, but no matter how seasick he may be he should make every endeavor to take his accustomed quantity of carbohydrate. Ginger ale, orange juice, chicken broth with rice, tea or coffee with sugar, or gruels may be retained when solid food such as cereals, crackers and toast are rejected. If the patient is on protamine zinc insulin it should be continued even if the urine is sugar free and the same holds true for the breakfast dose of regular insulin. If sugar recurs during the day, supplementary doses of regular insulin could be given according to the following formula:

Red	Orange	Yellow	Green	Blue	Color of test
16	12	8	4	0	Units of unmodified insulin

A diabetic patient taking as much as 80 units of insulin a day can most certainly be allowed to make a sea voyage provided his general condition warrants it. With diabetes of this severity, however, the following precautions should be observed: 1. The ship's doctor should know of the prospective passenger well in advance of the sailing so that supplies, including those for the giving of parenteral fluid and dextrose, may be checked. 2. On embarking, the patient should present himself to the ship's doctor and subsequently should report to him if illness arises. 3. The patient should take with him an ample supply of insulin (including unmodified insulin for emergency use) together with simple apparatus for the testing of urine for sugar. 4. It is desirable for an adult and imperative for a child to be accompanied on such a voyage by some responsible person who holds himself accountable for the well-being of the patient. If these precautions are observed, no difficulty should be experienced.

DUODENAL ILEUS

To the Editor:—Could you give me the signs, symptoms, etiology and treatment of duodenal ileus? J. N. TEETER, M.D., Englewood, N. J.

ANSWER.—Duodenal ileus may be defined as symptomatic obstruction at a point on the duodenum where it is crossed by the superior mesentery artery in the mesentery of the small intestine. It may occur subsequent to operation or develop suddenly without any obvious cause. Numerous theories have been suggested with little evidence.

After operation it may result from primary dilatation of the stomach with secondary dilatation of the duodenum. This may be due to a number of mechanical factors, including downward pressure of the stomach or traction of the small intestine on the root of the mesentery, localized peritonitis or neuromuscular changes in the duodenum. Chronic duodenal ileus may result from similar factors and may be idiopathic or result from some mechanical condition.

In the idiopathic type, no pathologic cause has been found at necropsy, but definite evidence points to the superior mesenteric artery as being the distal point of the obstruction, while neuromuscular changes in the duodenum may be important

V 1
193

factors. The chief symptoms of chronic idiopathic duodenal ileus are upper abdominal distention, periodic vomiting, loss of weight and toxic symptoms.

Aspiration of the stomach followed by x-ray examination of the duodenum after a barium sulfate meal, which may be done in the chronic type, will show dilatation and usually active reverse peristalsis. Acute duodenal ileus after operation is usually relieved by repeated aspiration with a stomach tube, although constant suction through a nasal tube is frequently valuable. Persistence of symptoms would suggest adhesions producing a mechanical obstruction, and reoperation would be indicated.

The chronic type, which is frequently intermittent with acute attacks, may be treated in a similar manner or the passage of a duodenal tube may be attempted. Between attacks small and frequent feedings may be of value. There is frequently failure to obtain relief, and operation is indicated.

If mechanical factors such as anomalous bands or pathologic changes cannot be found and the obstruction removed, it may be considered to be idiopathic duodenal ileus.

The operation of choice in the idiopathic type is a lateral anastomosis of the second portion of the duodenum to a loop of jejunum 8 or 10 inches from its origin.

POSSIBLE JUVENILE DEMENTIA PARALYTICA

To the Editor:—A boy, aged 12 years, has congenital syphilis. He had inadequate treatment of mercury rubs and bismuth preparations until 4 years of age. At that time the spinal fluid was positive and the blood Wassermann reaction four plus. Intensive and continuous treatment was then given for two years with sulfarsphenamine, tryparsamide, bismuth compounds and potassium iodide. He was allowed to rest about five months, as the spinal fluid and blood Wassermann reactions were negative. Potassium iodide by mouth, however, was given during these five months. At the end of this period he had severe convulsions, which lasted twelve hours. The spinal fluid and blood Wassermann reactions were still negative. Continuous treatment, except with six rest periods of four weeks each, with neoarsphenamine, tryparsamide and bismuth compounds were then given until the present date. The spinal fluid and blood Wassermann reactions have been negative all this time. The boy is physically well developed. He does not have saddle nose, keratitis or Hutchinson teeth. The heart, lungs and abdominal organs are normal. The boy has a few bad habits. He swears whenever he gets provoked. He is disobedient. He will take money from his parents. He is nervous, although he sleeps well. He bites his finger nails. He taps the floor with his feet if he has to sit still very long. He has a good appetite but bolts his food. He does not masturbate and he does not care to play with girls. He gets along fairly well with boys but in all his play with them he wants to run the whole show, and he gets very angry if they cross him. He has had two years of public school but is very trying to the teachers. Mostly he has had private tutoring. He can read and write well and works fourth grade arithmetic. He is becoming difficult for his parents to handle and is an only child. Should present treatment be discontinued? Can you suggest any further treatment? Can you suggest any private school or institution for this type of child? M.D., Illinois.

ANSWER.—The diagnosis of juvenile dementia paralytica is strongly suggested in this child and its possibility should be further investigated by consultation with a psychiatrist. An aid in the diagnosis of juvenile dementia paralytica would be the additional observations in the spinal fluid. In spite of the fact that the spinal fluid Wassermann test is said to have been negative since about the age of 6, it was originally positive. One would like to know the present status of the cell count, quantitative protein estimation, the amount of spinal fluid with which the Wassermann test was done, and the colloidal mastic curve.

If the diagnosis of juvenile dementia paralytica is substantiated, treatment should certainly not be discontinued until the child has been given induced malaria.

There are a number of private schools for this type of child, particularly suitable if the child does not have juvenile dementia paralytica. Definite suggestions for such a school may be obtained from a psychiatrist experienced in the management of difficult children.

VINCENT'S INFECTION OF URETHRA

To the Editor:—Please outline for me or send me references concerning the best treatment for Vincent's infection of the urethra. The patient is already receiving neoarsphenamine intravenously. M.D., New Jersey.

ANSWER.—References to Vincent's infection of the urethra are rare in recent literature and standard textbooks. Regarding treatment, several points should be emphasized. Arsphenamine should not be given intravenously until syphilis has been conclusively ruled out, and even then many believe that arsphenamine does more good as a topical application to the inflamed areas. Repeated cleansing daily by the patient with a weak solution of potassium permanganate or soap and water with special care that the preputial cavity is thoroughly exposed is advocated. The urethra should be irrigated daily by the physician with a weak solution of potassium permanganate under low pressure and a 2 per cent hydrogen peroxide injection done, with, of course, no attempt being made to retain the solution in the canal.

The prognosis in Vincent's infections is good if the infected areas are kept clean and exposed to oxygen, but if the inflammatory process proves stubborn, neoarsphenamine in small doses (from 0.2 to 0.3 Gm.) may be given once or twice, and some recommend 5 cc. of 1 per cent antimony and potassium tartrate solution given intravenously very slowly.

ESTERS OF PARAHYDROXYBENZOIC ACID AS PRESERVATIVES AND ANTISEPTICS

To the Editor:—A nose and throat specialist in a neighboring city prescribes a solution to be instilled in the eyes for attacks of hay fever which is said to be quite effective. The prescription includes a small amount of zinc sulfate and tincture of cudbear in a solution of 2 grains (0.13 Gm.) of N-propyl-P-hydroxyl benzoate to a pint of distilled water. This last mentioned drug is obtainable only through the Eastman Company and no one of my acquaintances has heard of it before. Can you tell me something of its action and uses? M.D., Texas.

ANSWER.—Several esters of para-hydroxybenzoic acid (parasalicylic acid) have been introduced as antiseptics, especially for the purpose of preserving foods, medicines and cosmetics. Usually the substances are referred to by trade names; for instance, the propyl ester as "Nipasol M," the ethyl ester as "Nipagin A," the methyl ester as "Nipagin M." These "Nip" preparations are of German origin and are sold in this country by the Goldschmidt Corporation, 147 Waverly Place, New York City.

References:

The Preserving Power, Chemical Identification and Pharmacology of *p*-Hydroxybenzoic Esters, *Ztschr. f. angew. Chem.* **42**: 936, 1929; abstr. *Chem. Abstr.*, 1930, p. 160.

Pharmacology of Some *p*-Hydroxybenzoic Acid Esters: Their Fate in the Organism and Toxicity, *Arch. f. exper. Path. u. Pharmakol.* **146**: 208, 1929; abstr. *Chem. Abstr.*, 1930, p. 4834. (Animal experiments with the ethyl, methyl and propyl esters indicate that the methyl ester is the most toxic while the propyl ester is the strongest antiseptic.)

The Use of *p*-Hydroxybenzoic Esters in Sterilization and Disinfection, *Pharm. acta helv.* **5**: 286, 1930; abstr. *Chem. Abstr.*, 1931, p. 1638.

Use of Nipasol for Sterilization, *Süddeutsche Apoth. Ztg.*, 1931, p. 731; abstr. *Quart. J. Pharmacy & Pharmacol.*, 1932, p. 117.

Apotheker Zeitung, May 25, 1932, p. 630. In this paper Eschenbrenner reports favorably on the preservation of various collyriums with either Nipasol M or its sodium salt in concentrations of 0.04 or 0.1 per cent.

Disinfectant Action of Nipasol Sodium in Tissue Fluids, *Zentralbl. f. Bakt.*, Nov. 1, 1933, p. 138.

Sterilization Experiments on Eye Waters with Hydroxybenzoic Esters, *Pharm. acta helv.* **10**: 103, 1935; abstr. *Chem. Abstr.*, 1936, p. 3166.

Remington's Practice of Pharmacy, Philadelphia, J. B. Lippincott Company, 1936.

The Eastman Kodak Company supplies the information that N-propyl-P-hydroxybenzoate was prepared in their laboratory to be used only in chemical research. The company had no idea that it was used for the medical purpose mentioned. Methyl-P-hydroxybenzoate and ethyl P-hydroxybenzoate are much in use as general preservatives, particularly in the food and drug field, and while they have no details to report, N-propyl-P-hydroxybenzoate has also been investigated from this standpoint.

RELATION OF ARTERIAL AND VENOUS PRESSURE

To the Editor:—What is the relation of venous blood pressure to arterial pressure, especially high blood pressure?

J. E. SCHMIDT, M.D., Baltimore.

ANSWER.—There is no fixed or mathematical relationship between the venous pressure and the arterial tension. Both levels of pressure tend to fall with rest or sleep, but otherwise they vary quite independently. It is claimed by many investigators that abnormally high venous pressure invariably means cardiac failure, irrespective of the cause of the failure. On the other hand, there have been reported observations, both here and abroad, which indicate that a moderate increase in the venous pressure may occur in hypertensive states without demonstrable cardiac failure. These opposed views may both be correct, since very early impairment of the cardiac reserve may be almost undetectable. It must be emphasized that the venous pressure, besides being highly susceptible to the effects of gravity (it is properly measured only at the level of the heart), arises from two independently variable factors: the rate of capillary blood flow and the back pressure from the heart. In hypertensive arterial disease the precapillary arterioles are constricted and thus the capillary flow is usually reduced. The greater the arteriolar constriction, the poorer the capillary cir-

culation. But there may be certain hypertensive states in which arteriolar constriction is absent or minimal, as, for example, in the systolic hypertension of hyperthyroidism or the hypertension of coarctation of the aorta. In such instances, with the capillary flow increased, some rise in the venous pressure can well be expected even without cardiac incompetence. Thus any relationship that may exist between the arterial and venous pressures is dependent on the state of the arterioles and the subsequent extent of the capillary blood flow. Physical exertion has little or no effect on the venous pressure in health, but when there is cardiac depletion exertion results in a notable rise of the venous pressure (from 2 to 7 cm. of water pressure). The arterial tension normally varies much more with exertion, fatigue, excitement, fear or relaxation.

SYPHILOPHOBIA

To the Editor:—A man, aged 43, contracted syphilis during the war. This was first discovered during a rheumatic attack. He was given treatment for fifteen months in the navy and after his discharge he went to a private physician for two more years. The physician discharged him and told him that he might marry. His treatment was one month of neoarsphenamine and one month of a bismuth compound. He was married three years afterward and two normal children were born. During the pregnancy his wife had hypertension and kidney trouble. At present she has a blood pressure of 190 systolic, 100 diastolic, the urine is clear, and there is no albumin or casts. She complains of headache, backache and itchiness of the skin. Her husband insists that she has syphilis. Her first Wassermann reaction was negative and after a provocative dose of neoarsphenamine it was again negative. Could it be possible that she has syphilis?

M.D., New Jersey.

ANSWER.—It is not possible to state definitely from the data submitted that the woman does or does not have syphilis. The information with regard to the amount of treatment the husband received and the status of his blood and spinal fluid are not the criteria to determine the wife's status. As her blood tests have been repeatedly negative, and if the children's tests are also negative, if the mother's spinal fluid is negative and if she shows no clinical signs of syphilis, the question of her having syphilis can be dropped. None of the wife's symptoms described in the inquiry seem to be attributable to syphilis.

SCARLET FEVER WITHOUT PHARYNGITIS

To the Editor:—A girl, aged 8 years, had a temperature of 102 F. with a mild scarlet fever-like rash over her body and on the inside of the arms and a slight circumoral pallor. At no time has she had a sore throat. A diagnosis of mild scarlet fever was made. Is it possible to have a scarlet fever without a sore or infected throat?

M.D., Michigan.

ANSWER.—If a person who is only slightly susceptible to scarlet fever, in other words, a person who has considerable scarlet fever antitoxin in his blood but not quite enough to protect against any manifestation of the disease, becomes infected with scarlet fever streptococci in the throat, he may have so slight a sore throat that it is unnoticed.

It is also possible for scarlet fever to result from the specific streptococci entering the body at some point other than the throat, such as a sinus, surgical lesion or the puerperal uterus.

CONVULSIONS IN YOUNG GIRL

To the Editor:—A girl, aged 5, has been troubled from birth with obstinate constipation. There is also a past history of unexplained attacks of fever. In January 1937 gastro-intestinal roentgenograms showed a marked elongation of the pelvic or sigmoid colon with no dilatation. She has had two convulsions occurring at night, one in March and one in July. Following the attacks she was normal except for slight and transient dermatitis on the face and chest. Physical examination is entirely negative except for a palpable spleen. The urine and blood are normal except for the differential count, which showed 46 per cent polymorphonuclears, 17 per cent eosinophils, 34 per cent lymphocytes and 3 per cent monocytes. The day after the count was made the patient developed hay fever. Repeated examinations of the stools have been negative for parasites. The patient has no other signs of allergy. There is a history of epilepsy in the father's immediate family and distantly in the mother's. Is this likely to be a case of early epilepsy or convulsions due to the elongation of the colon? What is the prognosis and what treatment would you advise?

JOHN M. KIDD, M.D., Galion, Ohio.

ANSWER.—The obstinate constipation may be due to, or the cause of, the elongation of the colon. However, the finding of an elongation or redundant loops of the colon is not unusual and has no particular significance. It would be impossible to make a diagnosis on the simple statement of two nocturnal convulsions. Information concerning the type of convulsions and the association with infection or fever would be valuable. It is quite possible that the attacks of fever are associated with a recurrent pyelonephritis. The urine may be "normal" between attacks. Culture of a catheterized specimen should be made and repeated if negative. The 17 per cent eosinophil count may be attributed to the allergy. It may be stated that the convulsions are not per se the result of the elongation of the colon. If the convulsions were not preceded by infection or fever, if they were generalized in type and were followed by coma or stupor, it is possible that they are the first seizures of idiopathic epilepsy. The palpable spleen has no particular significance. It is advisable to examine the optic disks, to obtain a Wassermann test on both blood and spinal fluid and to complete the examination of the spinal fluid. It is impossible to determine the prognosis. There is no particular treatment except to correct the constipation and to prescribe a normal diet. If possible the next convulsion should be observed or reported in detail. This information may make it possible to give a diagnosis.

MENTHOLATED CIGARETS

To the Editor:—Not long ago, somewhere in the literature, I read of some cardiac deaths attributed to the smoking of mentholated cigarets. Has this fact been borne out definitely, and if so how many cases have been reported?

B. H. BAYER, M.D., Houston, Texas.

ANSWER.—Neither the Anticigarette League nor the manufacturer of mentholated cigarets was able to locate the reference mentioned. The answer given in Queries and Minor Notes in THE JOURNAL, Jan. 16, 1937, page 229, that "there is no evidence that the smoking of mentholated cigarets is harmful because of the menthol" appears well founded. The amount of menthol in such cigarets is so small in proportion to the amount of nicotine and other agents which may be expected to affect the heart, and the absorption of menthol in the smoke, accordingly, so much less than occurs with the common use of mentholated nose and throat applications, that it is highly improbable that the menthol in cigarets could ever be really responsible for cardiac deaths.

FOOT BATH FOR PREVENTION OF RINGWORM

To the Editor:—Kindly give me directions for making a prophylactic foot bath for use in the shower bath of a gymnasium.

F. W. LINN, M.D., Cleveland.

ANSWER.—A most efficient foot bath for the prevention of ringworm infection is that proposed by Earl D. Osborne and Blanche S. Hitchcock (The Prophylaxis of Ringworm of the Feet, THE JOURNAL, Aug. 15, 1931, p. 453). A 1 per cent solution of sodium hypochlorite is filled to the depth of 2 inches in a rubber pan about 2 feet square or in a well sunk in the gymnasium floor. Each person is required to step both feet in this bath on the way to the shower and again on the return. The solution should be changed every second day.

ELECTRICITY AS CAUSE OF DEATH

To the Editor:—Are there any postmortem tests of the blood or the organs which would be proof of death by electricity?

FRANK G. CALDER, M.D., Johnstown, N. Y.

ANSWER.—There are no such dependable tests. Lightning may cause lightning marks, red arborizations of the skin or diffuse skin burns and rarely may fracture bones and disrupt organs. The electric current of low voltage may produce no marks. Even high voltage current, where conduction is good, may leave no marks. Usually there are burns at the points of contact, often with electrolytic metal deposits, and sometimes burns or hemorrhage at the points of exit. The internal organs may show hemorrhages, which are not distinctive. The blood is always fluid. Death may be due to the heating of the brain (up to 145 F.), and vacuolation about vessels with changes in ganglion cells have been reported. Exclusion of other adequate causes of death, with the circumstantial evidence, is often helpful.

CALOMEL DUSTING POWDER IN HOSPITAL NURSERY

To the Editor:—Is there any danger in the use of a talcum dusting powder containing calomel in a hospital nursery for the treatment of impetigo? If not, what percentage should be used?

M.D., New York.

ANSWER.—There is no danger in the addition of mild mercurous chloride (calomel) to talcum powder, in which it may be incorporated to the extent of from 10 to 20 per cent provided the patient does not receive iodide internally.

Council on Medical Education and Hospitals

ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, Dec. 18, 1937:

Hospitals Approved for Intern Training

St. Anthony's Hospital, Terre Haute, Ind.
House of Mercy Hospital, Pittsfield, Mass.
St. Luke's Hospital, Pittsfield, Mass.
Lutheran Deaconess Home and Hospital, Minneapolis.
Margaret Pillsbury General Hospital, Concord, N. H.
St. James Hospital, Newark, N. J.
Mount Vernon Hospital, Mount Vernon, N. Y.
Women's and Children's Hospital, Toledo, Ohio.
Medical Arts Hospital, Dallas, Texas.
Nix Hospital, San Antonio, Texas.
Providence Sanitarium, Waco, Texas.
St. Luke's Hospital, Milwaukee.

Hospitals Approved for Residencies in Specialties

Anesthesia
Harper Hospital, Detroit.
Columbia Hospital, Milwaukee.

Gynecology
Harlem Hospital, New York City.

Malignant Disease
Brooklyn Cancer Institute of Kings County Hospital, Brooklyn.

Medicine
Joseph H. Pratt Diagnostic Hospital, Boston.
Huron Road Hospital, East Cleveland, Ohio.
Parkland Hospital, Dallas, Texas.

Mixed
McMillan Hospital, Charleston, W. Va.

Neuropsychiatry
Michael Reese Hospital, Chicago.
Northampton State Hospital, Northampton, Mass.
Central Islip State Hospital, Central Islip, N. Y.
Western State Hospital, Fort Steilacoom, Wash.

Neurosurgery
Jewish Hospital, Brooklyn.
Hospital of the University of Pennsylvania, Philadelphia.

Obstetrics
Cooper Hospital, Camden, N. J.
Fordham Hospital, New York City.
Harlem Hospital, New York City.
Parkland Hospital, Dallas, Texas.

Obstetrics-Gynecology
Jewish Hospital, Brooklyn.

Ophthalmology
Colorado General Hospital, Denver.

Orthopedics
Temple University Hospital, Philadelphia.
Parkland Hospital, Dallas, Texas.

Otolaryngology
Jewish Hospital, Brooklyn.

Pathology
Grady Hospital, Atlanta, Ga.
Mountainside Hospital, Montclair, N. J.
Fordham Hospital, New York City.
Baylor University Hospital, Dallas, Texas.
Queen's Hospital, Honolulu, Hawaii.

Pediatrics
Children's Hospital, Birmingham, Ala.
Morrisania City Hospital, New York City.

Radiology
Colorado General Hospital, Denver.
Harper Hospital, Detroit.
Jewish Hospital, Brooklyn.
Methodist Episcopal Hospital, Brooklyn.
Morrisania City Hospital, New York City.
Baylor University Hospital, Dallas, Texas.
Parkland Hospital, Dallas, Texas.

Surgery
St. Luke's Hospital, San Francisco.
William W. Backus Hospital, Norwich, Conn.
Butterworth Hospital, Grand Rapids, Mich.
Coney Island Hospital, Brooklyn.
Jewish Hospital, Brooklyn.
Meadowbrook Hospital, Hempstead, N. Y.
Parkland Hospital, Dallas, Texas.
St. Mary's Hospital, Milwaukee.

Thoracic Surgery
Sanatorium Division of the Boston City Hospital, Boston.
University Hospital, Ann Arbor, Mich.

Tuberculosis
Gaylord Farm Sanatorium, Wallingford, Conn.
Kingston Avenue Hospital, Brooklyn.

Urology
Harper Hospital, Detroit.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 28. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, April 5-6. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, June 4. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, June 21-22. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Medical (Eclectic).* Little Rock, June 21. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 11, Los Angeles, July 11, San Francisco, Sept. 14, and Los Angeles, Nov. 16. *Written examinations.* San Francisco, June 27-30, Los Angeles, July 11-14, and Sacramento, Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, April 6-8. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Medical. Endorsement.* Hartford, March 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Basic Science.* New Haven, June 11. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven.

DELAWARE: Dover, July 12-14. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, June 27-28. *Medical.* Washington, July 11-12. Asst. Sec., Commission on Licensure, Mr. Paul Foley, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, April 11-14. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, April 5-6. Commissioner of Law Enforcement, Hon. J. L. Balderston, 205 State Capitol Bldg., Boise.

ILLINOIS: Chicago, April 5-7, June 28-July 1, and Oct. 18-20. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 21-23. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 7-8. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, June 8-10. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. 3rd St., Louisville.

MARYLAND: *Medical (Regular).* Baltimore, June 21-24. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 21-22. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 15-17. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, April 5-6. Sec., Dr. J. Chase McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, April 19-21. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, April 5-6. Sec., Dr. S. A. Cooney, 205 Power Block, Helena.

NEBRASKA: *Basic Science.* Omaha, May 3-4. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 2. Sec., Dr. John E. Worden, Capitol Bldg., Carson.

NEW JERSEY: Trenton, June 21-22. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, April 11-12. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 27-30 and Sept. 19-22. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 13. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: *Basic Science.* Oklahoma City, May 4. Sec. of State, Hon. Frank C. Carter, State Capitol Bldg., Oklahoma City. *Medical.* Oklahoma City, June 8-9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science:* Corvallis, July 16, and Portland, Nov. 19. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene. *Medical. Reciprocity.* Portland, April 6. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, April 7-8. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 28. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.
SOUTH DAKOTA: July 19-20. Director of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.
TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.
VERMONT: Burlington, June 15-17. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.
VIRGINIA: Richmond, June 22-24. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.
WEST VIRGINIA: Huntington, March 21-23. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.
WISCONSIN: *Basic Science*. Madison, April 2. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Milwaukee, June 28-July 1. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners* and *Special Boards* were published in THE JOURNAL, March 12, page, 835.

California October Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the written examination held at Sacramento, Oct. 19-21, 1937. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. Fifty-two candidates were examined, 47 of whom passed and five failed. The following schools were represented:

PASSED

School	Year Grad.	Per Cent
College of Medical Evangelists	(1936) 84, (1937) 78, 88, 88.3	
Stanford University School of Medicine	(1934) 85.3, (1937) 80.3, 80.7, 86, 86.6, 87.7	80.8
University of California Medical School	(1937)	79.8,
Yale University School of Medicine	(1936)	83
George Washington University School of Medicine	(1936)	78
Loyola University School of Medicine	(1923)	88.9
Northwestern University Medical School	(1934) 80.8, (1936) 88.3, (1937) 88.1	88.1*
University of Illinois College of Medicine	(1937)	89.2
State University of Iowa College of Medicine	(1936)	82, 82.9
Wayne University College of Medicine	(1936)	87.1
St. Louis University School of Medicine	(1937)	79, 79.6
Washington University School of Medicine	(1936)	79.3,
Creighton University School of Medicine	(1936) 78.7, (1937)	77.7
Lincoln Medical College, Nebraska	(1916)	78.6
Cornell University Medical College	(1920)	80.8
Ohio State University College of Medicine	(1937)	82.3
University of Oklahoma School of Med.	(1935) 83.2, (1936)	83.2
University of Oregon Medical School	(1937)	85.8
University of Pennsylvania School of Medicine	(1936)	83.6
Baylor University College of Medicine	(1937)	76.9
University of Toronto Faculty of Medicine	(1931) 83.4, (1934)	84.4
McGill University Faculty of Medicine	(1935) 83.7, (1936)	85.1
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg	(1923)	77.1†
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1922) 82.8, (1924) 86.8,† (1925)	84
Universität Heidelberg Medizinische Fakultat	(1922)	86.1†
Vereinigten Friedrichs-Universität Medizinische Fakultat, Halle-Wittenberg	(1920)	75.6†
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest	(1935)	76.2

FAILED

School	Year Grad.	Per Cent
University of Arkansas School of Medicine	(1933)	72.4
Northwestern University Medical School	(1931)	73.7
Tufts College Medical School	(1934)	73.8
Hamburgische Universität Medizinische Fakultat	(1920)	‡
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1931)	60.1

Fifty physicians were licensed by reciprocity and seven physicians were licensed by endorsement from October 6 through December 27. The following schools were represented:

LICENSED BY RECIPROCITY

School	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1929)	Arkansas
College of Medical Evangelists	(1934)	Ohio
University of Colorado School of Medicine	(1935), (1936)	Colorado
Emory University School of Medicine	(1926)	Georgia
Chicago College of Medicine and Surgery	(1915)	Nebraska
Northwestern University Medical School	(1909) (1928) Indiana, (1933) Ohio, (1936) Colorado	Illinois,
Rush Medical College	(1906) South Dakota, (1934)	Utah
University of Illinois College of Medicine	(1932)	Illinois
Indiana University School of Medicine	(1935, 2)	Indiana
State University of Iowa College of Medicine	(1928) (1930) Iowa	Montana,
University of Kansas School of Medicine	(1933), (1934) Kansas, (1935) Arizona	
Harvard University Medical School	(1933)	Tennessee
Tufts College Medical School	(1907) Connecticut, (1923)	Mass.
University of Minnesota Medical School	(1933), (1937)	Minnesota
St. Louis University School of Medicine	(1934), (1936)	Missouri
Washington University School of Medicine	(1927), (1935)	Missouri
Creighton University School of Medicine	(1929)	S. Dakota
University of Nebraska College of Medicine	(1922), (1929), (1932) Nebraska	
Albany Medical College	(1928)	New York
Ohio State University College of Medicine	(1936)	Ohio
Jefferson Medical College of Philadelphia	(1896) (1927) Pennsylvania	N. Dakota,
Temple University School of Medicine	(1935)	Penna.
Baylor University College of Medicine	(1936)	Texas
University of Wisconsin Medical School	(1930)	Missouri
University of Manitoba Faculty of Medicine	(1929)	Washington
Queen's University Faculty of Medicine	(1914)	Iowa
University of Toronto Faculty of Medicine	(1934)	Missouri
McGill University Faculty of Medicine	(1929)	New York
Karl-Franzens-Universität Medizinische Fakultät, Graz	(1924)	Illinois
Medizinische Fakultät der Universität Wien	(1926)	Iowa
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	(1910)	New York
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1927)	Illinois
University of Edinburgh Faculty of Medicine	(1931)	New York
Université de Lausanne Faculté de Médecine	(1919)	New York

LICENSED BY ENDORSEMENT

School	Year Grad.	Endorsement of
College of Medical Evangelists	(1935), (1936)	N. B. M. Ex.
Emory University School of Medicine	(1930)	U. S. Navy
Loyola University School of Medicine	(1931)	U. S. Navy
Northwestern University Medical School	(1928)	N. B. M. Ex.
University of Michigan Medical School	(1933)	N. B. M. Ex.
University of Pennsylvania Department of Medicine	(1905)	U. S. Navy

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.
† Verification of graduation in process.
‡ Grade not reported. Verification of graduation in process.

Book Notices

A Pediatrician in Search of Mental Hygiene. By Bronson Crothers, M.D., Assistant Professor of Pediatrics, Harvard Medical School, Boston. Cloth. Price, $2. Pp. 271. New York: Commonwealth Fund; London: Oxford University Press, 1937.

As the title implies, this volume is in no sense a textbook. Rather it is a philosophic discussion of an important problem or group of problems. Some of the questions many pediatricians would like to have answered are "What is the function of the pediatrician in the program of mental hygiene or, more specifically, what shall he do about the psychologic and psychiatric difficulties of his patients; what is the function of the pediatric teacher in these problems; what also is the job of the hospital and clinic?" There is no mathematical answer and, as stated, the arguments must be essentially philosophic. In support of his own argument and in his criticism of those of others, Dr. Crothers brings to bear his usually significant terminology and persuasiveness, and his conclusions, when he reaches them, are to be treated with the respect which his intelligence and experience warrant. He explains that he is a conventionally trained pediatrician who has kept up an interest in neurology and who has had a period of training in a neurophysiologic laboratory. The first part of the book is divided into a rather rambling discussion of such subjects as the doctor in the community, mental hygiene as a pediatric investment, and the pediatrician in cooperation with others interested in children. In part two there is more specific detailing of medical education, the children's hospital, the child guidance clinic, and a teaching experiment in action in a children's hospital in Boston; there are other chapters which end with a survey and summary of the present situation accompanied by certain recommendations. Since Dr. Crothers makes his statements cautiously, he is difficult to quote with exactness. Among his conclusions, however, are the following: There should be improvement of physical care of children who are not sick in the ordinary sense; there should be the most effective use of the best present standards of physical growth and development; there should be selection of relevant material from the vast source of accurate information collected by psychologists on mental development and utilization of this material in appropriate medical situations. There should be a serious attempt to select and adopt the relevant attitudes and technics of psychiatry, the first step in this being to search for material which is important in relation to the usual pediatric problems of physical and psychic disorders. There are several important negative statements which suggest that the pediatrician should not expect to duplicate the work of the trained psychiatrist interested in children, that he should hesitate to undertake the study of delinquency or try to deal with children whose behavior suggests the presence of mental disease as ordinarily understood, that he should not regard prevention of mental disease as within his capacity, and above all that he should not allow himself to get into a position

V 1
193

in which he takes diagnostic or therapeutic charge of an adult as an incident of treating a child. It is obvious that Dr. Crothers does not believe that many pediatricians are competent in the field of mental hygiene and that a program of this sort needs the help of others with more specific training. He does not want anything to happen to the pediatrician which will prevent him from meeting his fundamental duty of giving prompt, effective and intelligent care to sick children. One is tempted to quote further, but those who are interested, and they should be many, must consult the book in its entirety.

The Collapse Therapy of Pulmonary Tuberculosis. By John Alexander, B.S., M.A., M.D., Professor of Surgery, University of Michigan. Cloth. Price, $15. Pp. 705, with 367 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1937.

When Alexander's first book on thoracic surgery appeared, in 1925, it stimulated a wide interest in the subject and provided physicians with much information concerning a subject that was relatively new. In the past twelve years, chest surgery has developed with great rapidity and no one has had finer experience, has made better contributions, has stimulated more general interest or has done better teaching of students and graduates in medicine than Alexander. Therefore it is particularly fitting that he has brought together, in collaboration with three other physicians who are among the best in their specialties, all the available information on collapse therapy of pulmonary tuberculosis. This book includes every phase of collapse therapy, as well as the history of the various surgical procedures and the technic of operations, together with the indications and contraindications for each. It is of use not only to the surgeon but also to the internist and the general practitioner. Indeed, every physician must know of the possibilities of collapse therapy in pulmonary tuberculosis in order that he may treat his patients by the most modern methods or recommend, at the time these are indicated, surgical aid. For such information Alexander's book is authentic and contains the last word on the subject of collapse therapy of pulmonary tuberculosis. It is a fine example of modern American printing. The type page is larger than is usually seen, but it is beautifully proportioned and the clear and sharp type used is well arranged for ease in reading. The book is unique in using double columns for the first five chapters and single columns for the chapters devoted to operation. The paper is admirably adapted to bring out the detail of superb illustrations of roentgenograms and line drawings. It is a rare medical book that reflects in any such degree the qualities of the really good and adequate presswork seen throughout the book, which, in great measure, may be considered to represent a decided step forward in its physical perfections of presswork, paper and binding. All in all the book sets a new standard in format and make-up for American medical works. One might write many pages on the excellent qualities of this book, but suffice it to say that it should be available to every physician.

110
938

Traité d'helminthologie médicale et vétérinaire. Par M. Neveu-Lemaire, professeur agrégé, chef des travaux de parasitologie à la Faculté de médecine de Paris. Paper. Price, 175 francs. Pp. 1,514, with 787 illustrations. Paris: Vigot Freres, 1936.

This falls into four unequal parts. The first opens with a historical review and describes parasitism by helminths, their habitat, localization, reproduction, life cycle and intermediate hosts of larval stages, portals of entry into hosts, migrations within the body of the host, paths of exit from hosts, geographic distribution, effects on the host, cellular and humoral reactions of the parasitized organism, effects on the intermediate invertebrate hosts, effects of the host on its helminth parasites, methods of examination and study of helminths, and nomenclature of helminths and helminthiases. The second, or main, part of the book contains the special helminthology, in which the different species of trematodes, cestodes, nematodes and acanthocephalid worms of man and his domestic animals are described, figured and classified according to the latest zoological information and in accordance with the International Rules of Nomenclature. Each species is given a uniform presentation including synonymy, morphology, habitat, ecology, geographic distribution, hosts and pathogenic role. Each helminthiasis is passed in review with reference to its symptomatology, pathogeny, pathologic anatomy, etiology, diagnosis, prognosis, treatment and prophylaxis. Tabular views of the distinguishing characteristics of related species are set up to assist in identification of species of important genera. The third part is a catalogue of all the known helminths parasitic in the forty-five domesticated mammals and thirty-nine birds. Homo sapiens has to his discredit forty different flukes, thirty-three tapeworms, sixty-seven roundworms and two acanthocephalids. The fourth part contains the lists of intermediate hosts, vertebrates, mollusks, arthropods and annelids, and designations of the stages which they harbor, knowledge of which is essential for preventive measures.

Any work of such scope as this is necessarily incomplete, partly because of lack of material, more often because the original investigator omitted or could not obtain essential data. Such a classified compilation brings these deficiencies into high relief and opens the way for the completion of needed information. One of the most trying deficiencies is the lack of figures and measurements of ova on which diagnosis of infections so largely rests. The book is a mine of information not only on well known helminths but also on the rarer and occasional ones which the physician and veterinarian may sometimes meet.

Recent Advances in the Study of Rheumatism. By Frederic John Poynton, M.D., F.R.C.P., Consulting Physician, University College Hospital and the Hospital for Sick Children, Great Ormond Street, and Bernard Schlesinger, M.A., M.D., F.R.C.P., Physician to the Children's Department, Royal Northern Hospital, London. Second edition. Cloth. Price, $5. Pp. 380, with 51 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1937.

Twenty-one of the twenty-three chapters in this book are written by two of the best investigators of acute rheumatic fever and of the chronic forms of arthritis. Both have contributed much to knowledge of these diseases. In this edition they have presented the new as well as the more established ideas about etiology, bacteriology, pathology and treatment of rheumatic diseases. There is an excellent review of the literature of rheumatic fever, dealing with predisposing causes, pathology, bacteriology, tonsillitis and rheumatism, allergic factors, electrocardiography, immediate treatment with drugs, vaccine and serum therapy, and convalescent treatment. There is a shorter but good review of the recent work on rheumatoid arthritis and osteo-arthritis, with chapters on the comparison of acute and chronic types of rheumatism, industrial aspects, predisposing causes, pathology and radiology, bacteriology, focal infection, constitutional disturbances, clinical problems and treatment. The last includes general measures, vaccines, protein shock, apiotherapy, histamine, diet, gold salts and sulfur. The many conflicting opinions expressed in the literature regarding etiology and treatment make this critical review of the literature of utmost value to minimize faddism in the treatment of rheumatism and in helping to evaluate present information for its practical application in the understanding and treatment of rheumatism. The whole subjects of rheumatic fever, rheumatoid arthritis and osteo-arthritis are well reviewed and practical treatments are advised. Gout is not discussed. Gonorrheal arthritis is given little space. The last two chapters, on physical therapy and on surgery, are written by other authors. They are both much too short to allow the subject to be well presented. The writers of these chapters have used different classifications than those used in the rest of the book and the selection and arrangement of their material is considerably below the standard of that set in the earlier chapters. The book gives an excellent review of recent advances in rheumatism and should be of particular value to physicians interested in the rheumatic diseases.

Diseases of the Ear, Throat, and Nose. By J. Douglas McLaggan, M.A., M.B., F.R.C.S., Surgeon in Charge of the Ear, Nose, and Throat Department, Royal Free Hospital, London. Cloth. Price, 15s. Pp. 238, with 144 illustrations. London: H. K. Lewis & Co., Ltd., 1937.

Books of this character written for the general practitioner and medical student are frequently disappointing. Generally they are small, but their size is no indication of conciseness. Their lack of bulk is frequently an attempt to keep the cost down. Catering, as he does, to the tastes of a special group, the author frequently attempts to give the reader what he thinks the reader wants. The result is a lack of emphasis on the disagreeable, such as anatomy and physiology, and a great deal of

emphasis on the technic of operative procedures, many of which the reader in question is unqualified to do. Should he wish to do them his training, of course, would have to be obtained in a far different way than by reading. This book is, however, an agreeable surprise. It is truly concise. There are a good many illustrations which are clear and to the point and there is no space wasted on difficult operations that the reader has no right to do. The common ailments are clearly described and the impression one gets is that here is an author whose descriptions of diseases comes from his own experience.

The Endocrines in Theory and Practice. Articles republished from the British Medical Journal. Cloth. Price, 9s.; $3.50. Pp. 278, with illustrations. London: H. K. Lewis & Co., Ltd.; Philadelphia: P. Blakiston's Son & Co., Inc., 1937.

These twenty-eight articles, by twenty-four authors, appeared serially in the *British Medical Journal* and are here reproduced in their original form. The treatment of the various subjects is of course uneven and, unfortunately, little attempt has apparently been made to integrate the articles into a uniform whole as a comprehensive treatise. Each section is therefore a separate entity. Despite these shortcomings, the first of which is inherent in any symposium, this collection of papers is a valuable one. Many of the authors are well known experts in their fields and a number of the reviews are of unusual excellence. Emphasis has been placed chiefly on clinical applications of endocrinology and in general the authors are commendably conservative in their views. E. C. Dodds, R. L. Noble, S. Levy Simpson, Sir Walter Langdon-Brown, Otto Leyton, J. H. Biggart and N. M. Dott write on various aspects of pituitary physiology and pathology; F. E. A. Crew contributes a section on pregnancy tests; C. R. Harington, Sir Robert McCarrison, F. R. Fraser, Sir Thomas Dunhill, H. Gardiner-Hill and D. Murray Lyon consider the thyroid; S. Levy Simpson and A. W. Spence cover the adrenals; E. C. Dodds, J. M. Robson, T. N. A. Jeffcoate and P. M. F. Bishop devote sections to the female reproductive apparatus and its endocrine principles; R. K. Callow, A. S. Parkes and K. M. Walker do likewise for the male; Samson Wright covers the thymus and pineal, Donald Hunter the parathyroids; Sir Walter Langdon-Brown and Sir Humphry Rolleston, respectively, open and close the series with general articles. Unfortunately the symposium is not complete; for some unexplained reason sections devoted to principles of the pancreas, gastro-intestinal tract and liver are not incorporated. With but few reservations with regard to not more than three or four of the articles included in this book, it may be recommended to those who desire a brief and authoritative review of an important and fascinating subject.

Physical Therapy in Arthritis. By Frank Hammond Krusen, M.D., Associate Professor of Physical Medicine, the Mayo Foundation, University of Minnesota. Foreword by Melvin S. Henderson. Cloth. Price, $2.25. Pp. 180, with 21 illustrations. New York: Paul B. Hoeber, Inc., 1937.

This little book, consisting of 120 pages of reading matter and sixty pages devoted to illustrations, references and index, is essentially a collection of excerpts from the recent American and English literature pertaining to the uses of physical therapy in the treatment of arthritis. For the most part, as the author states in the preface, the text consists of direct quotations from the works reviewed. In many instances these quotations take up almost an entire chapter with but one or two paragraphs of comment by the author. It is disappointing that the book does not reflect the wide experience which the author must have had in his association with a large clinic and that he does not express his own opinions more frequently with reference to the efficacy of the various procedures. For instance, from page 21 to page 29 the full wet pack is described. The patient is stripped naked in a room the temperature of which is 68-72 F. and wrapped in a sheet wrung out of water with a temperature of 60-70 F. Does the author believe that this is a useful measure in the treatment of chronic arthritis? Does he employ it in a more or less routine manner on his atrophic arthritis and/or his hypertrophic arthritis patients and has he been impressed by the improvement following its use? Since the author hopes that the book "will serve as a means of aiding the general practitioner," the lack of such specific information detracts much from its value. The book, however, is beautifully gotten up and as a review of the recent literature in the English language on physical therapy in arthritis it should prove useful to those who are interested in the subject.

Plastique mammaire: Considérations médico-chirurgicales. Par les Docteurs C. Claoué et Irène Bernard, licenciée ès sciences. Paper. Pp. 245, with 73 illustrations. Paris: Librarie Norbert Maloine S. A., 1936.

This monograph on mammary plastics is divided into four parts: Part I gives a historical survey of mammary esthetics throughout the ages; it also takes up the consideration of the relation of jurisprudence to reparatory mammary surgery and the risks taken by the operator. Part II deals with the necessity for and the indications which call for operation. The social, professional, pathologic and psychic aspects of deformed and hypertrophied breasts are discussed. Part III deals with the possibility of nonsurgical therapeutic curative measures for hypertrophied breasts. The authors evaluate local applications, compression, gymnastics and opotherapy. They point out the association of mammary gland disturbances with endocrine systemic imbalance and especially the influence of the hypophysis, placenta and ovaries. This section of the book is thorough. In part IV the various surgical plastic methods of correcting mammary deformities in the female are described, especially the methods developed in France. These include the procedures devised by Aubert, Dartigues, Hollander, Biesenberger, Schwarzmann, Claoué, Gläsmer, Noël and Pousson. These procedures are classed into two technical groups, namely, those in which the hypertrophied gland is resected without transposition of the nipple, and those in which following resection the nipple is transposed. All the technical details of each method are described. Particular mention is made of Claoué's personal method of mapping out and marking of the mammary region prior to undertaking reparatory surgery. The book is thoroughly illustrated and to the point. It is a complete exposition of all matters pertinent to esthetic surgery of the breast.

The Rabbit Test for the Detection of Chorionic Tissue in the Body and the Determination of Its Proliferative Activity. By S. B. Anklesaria, M.D., Honorary Obstetrician & Gynaecologist, Sheth Vadilal Sarabhai General Hospital & Chinai Maternity Home, Ahmedabad. With a foreword by Dr. Emil Novak. Cloth. Pp. 161, with 10 illustrations. Bombay: Fort Printing Press; London: H. K. Lewis & Co., Ltd., 1937.

The author has included in this book a great deal of material on tests for pregnancy both from his own experience and from the literature. Though it is written in a cumbersome style, contains many typographic errors and is poorly printed, it is nevertheless a valuable work. The many pregnancy tests proposed by different investigators are considered briefly with respect to their virtues and their deficiencies. Only the Friedman modification of the Aschheim-Zondek test survives the author's critical analysis as more nearly meeting the necessary qualifications of rapidity and reliability than any of the others. The major portion of this small volume is devoted to a detailed discussion of the theory and practice of the latter method. Various technical modifications are considered by the author; included also are many practical pointers designed to facilitate execution of the test and to render its interpretation more reliable.

The Roentgenologist in Court. By Samuel Wright Donaldson, A.B., M.D., F.A.C.R., St. Joseph's Mercy Hospital, Ann Arbor. Cloth. Price, $4. Pp. 230. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1937.

Distasteful as are most matters of law to the average physician, contact with legal procedures is almost inevitable at some point in his career. Some knowledge of the law and its ramifications into the medical sphere is imperative. This small, readable book clarifies in a simple, authoritative manner many medicolegal problems of importance not only to the roentgenologist but to members of the medical profession at large. The legal obligations of the physician to the general public are discussed in some detail, with particular attention to the present opinions of the courts on the status of radiology as a medical specialty. The causes and methods of prevention for malpractice suits are well presented. There is a particularly good discussion of the legal responsibility incumbent on the practitioner to use the roentgen method of diagnosis in various

V 1
193

diseases. An increasing number of court rulings hold that x-ray diagnosis, in certain conditions, is an integral part of the standard, ordinary practice of medicine. A chapter on the vexatious question of the ownership of roentgenograms cites sufficient judicial opinion to indicate finally that roentgenograms remain the property of the physician or institution by whom they were taken. The largest portion of the book is devoted to expert testimony. The author cites numerous court decisions which tend to clarify the question of the qualifications of an expert in the interpretation of roentgenograms. The troublesome problem as to the obligation of the physician to give opinion or expert testimony on subpena is settled, apparently to the disadvantage of the specialist. Roentgenograms are now commonly admitted as evidence by the courts, and the criteria for such admission is discussed. The author barely touches on the possibility of persuading the courts to rely entirely on expert interpretation, without demonstration of the films themselves, a most desirable improvement in procedure. Sound, astute advice for conduct on the witness stand is offered; a careful reading of this section would be of advantage to any physician expecting to testify. A review of the unfortunate aspects of expert testimony is of interest, emphasizing the fact that this problem is not a recent one. The whole question should be reopened and some new method proposed before further harm is done the prestige of the profession by the apparent venality too often exhibited by expert medical witnesses. This informative volume is liberally supported by citations from the courts and represents a worthy contribution to medicolegal literature.

Dental Histology and Comparative Dental Anatomy. By Rudolf Kronfeld, B.S., M.D., D.D.S., Professor of Dental Histology and Pathology in the Chicago College of Dental Surgery, School of Dentistry, Loyola University, Chicago. Cloth. Price, $3.75. Pp. 195, with 115 illustrations. Philadelphia: Lea & Febiger, 1937.

Because of the size of the type and spacing, the amount of text is even less than the size of the volume would indicate. The author explains this by saying "It has been my experience, both as a student and in teaching students, that most of the subject matter in histology is soon forgotten, not so much because of lack of interest as that the course is overloaded with names and terms, most of which have little meaning to the untrained mind. Therefore, it has been my intention to state the fundamentals as briefly and as clearly as possible in the hope that they may thus be more easily remembered." This goal has been attained, the numerous excellent illustrations, most of them photographs, assisting materially. At the close of each chapter are placed suggestions for the laboratory exercises; there is a short glossary of terms and proper names; there are questions on the text, and an adequate bibliography for collateral reading. There is an occasional questionable statement, as the one on page 43: "For no known reason, most of the dentin in older teeth is usually of irregular structure."

Leprosy: A Problem of Colonial Development. Report for 1936 of the British Empire Leprosy Relief Association Working in Co-Operation With TOC H. Paper. Pp. 32, with illustrations. London: The Association. [n. d.].

Founded in 1924, this association works in British colonies, protectorates and dependencies of the empire, within which it is estimated that there are 2,000,000 lepers. The incidence varies from 1 per cent in Nigeria to 30 per cent in Nauru (in 1924) and surveys seem invariably to reveal unexpectedly higher incidences. There are 100 cases in England, mostly acquired abroad, and the disease is not even notifiable there. The aims of the association are mainly educational, using special medical directors to establish centers for segregation of victims in countries of low economic and sanitary standards. All too often these refuges have been filled with old cases, no longer infectious. The association seeks by education and local organization to segregate the earlier and more infectious stages from the community and especially from young children and thus to reduce the incidence. Tribal and clan cooperation together with local support and some degree of economic independence on the part of the leper colony is the plan most favored. To these ends special instruction under medical supervision by lay and native helpers has been or is being organized in all parts of the British empire where this dread disease occurs. This report gives the details of this work of founding leproseries.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Chiropractic Adjustments as Medical Care.—The Utah workmen's compensation act requires an employer to pay "such a reasonable sum for *medical, nurse and hospital services, and for medicines*" as may be necessary to relieve a workman from industrial injuries, within limits not here material. The workman in this case, Shober, sustained an injury to his back and was treated by a chiropractor. The industrial commission disallowed Shober's claim for the expense of the chiropractic services on the ground that such services were not "medical services" within the meaning of the compensation act. This disallowance constituted the sole basis for the present appeal to the Supreme Court of Utah.

Chiropractic, said the Supreme Court, is defined by law in Utah as "palpating and adjusting the articulation of the spinal column by the hands only." In the vernacular of the layman, it consists of examining the spine of a patient to determine if a vertebra is displaced or out of alinement and of pressing on such vertebra, with the hands only, to force it back into its proper position. Such practice constitutes the practice of medicine in Utah. *Board of Medical Examiners* v. *Freenor*, 47 Utah 430, 154 P. 941, Annotated Cases 1917E, 1156; *State* v. *Erickson*, 47 Utah 452, 154 P. 948. Counsel for the commission contended, however, that, since chiropractors were not licensed to practice in Utah in 1917, the year the workmen's compensation act was enacted, chiropractic could not have been included within the term "medical service" as used by the legislature in that act. But, answered the Supreme Court, the legislature had in mind when it used the term "medical services" such services as are rendered by a person licensed to practice medicine within the state and it must have had in mind the Freenor and Erickson cases, decided in 1916, holding that chiropractic was the practice of medicine. Although a chiropractor does not use medicines or perform surgical operations, he does treat and operate on patients for physical ailments and but for his license would be liable to the penalty prescribed for practicing medicine without a license. The term "medicine" is not limited to curative or remedial substances; it also means the healing art, the science of preserving health and treating disease for the purpose of cure, whether such treatment involves the use of medical substances or not.

The services rendered by the chiropractor in this case, the court concluded, constituted the practice of medicine as defined by the medical practice act, were therefore medical services, were rendered by a person licensed to practice within that field, and should therefore have been allowed by the commission. The cause was remanded to the industrial commission.—*Shober* v. *Industrial Commission (Utah), 68 P. (2d) 756.*

Dental Practice Acts: Minnesota Law Imposing Advertising Restrictions Construed.—Prior to 1935 the plaintiffs had practiced dentistry under the name of the Nicollet Dental Clinic. Thereafter, because an amendment to the dental practic act prohibited the use of a corporate or trade name for dental practitioners associated together, they advertised themselves as "Dr. Gullings and Associates—Dentists. Successors to Nicollet Dental Clinic," and listed the name of each dentist in the group. Three of the dentists were advertised as "Specializing in Plates and Extractions." On being advised by the attorney general that their advertisement violated the dental practice act, they sought a construction of that act in an action in the district court of Ramsey County, Minn., under the declaratory judgment act. From an adverse judgment they appealed to the Supreme Court of Minnesota.

The issue before the court was whether that part of the advertisement naming the three dentists as specializing in plates and extractions constituted a violation of the dental practice act. After outlawing all advertising by dentists, said the court, the

act, by a proviso, permits a dentist to announce or print certain specified information "and if he *limits* his practice to a specialty he may announce it." The plaintiffs contended that this proviso authorized the advertisement that precipitated the controversy. All the plaintiffs, observed the court, were in the employ of a Dr. Gullings. Patients first entering the office were examined by him and directed to one of his associates for treatment. Each dentist was paid a salary in the form of a commission based on the amount of work each did. The relationship between Dr. Gullings and the other dentists was that of employer-employee. The three dentists named specially in the advertisement did specialize in plates and extractions but the other dentists engaged in a general practice. In the opinion of the court there was but one practice and one business being conducted by the plaintiffs and that practice was not a specialized one. It could hardly be claimed, said the court, that a dentist engaged in practice alone may have a general practice and also specialize in some branch of his profession and may not so announce, because his practice is not *limited* to a specialty, but that a group of dentists may associate themselves together and carry on a practice in which some of the members engaged in specialized work and the remainder in general practice, and that they may announce the fact that part of their practice is devoted to a specialty. The obvious intent of the legislature was otherwise. The advertisement, therefore, was declared to be of a type proscribed by the legislature and the judgment of the lower court was affirmed.—*Gullings v. State Board of Dental Examiners (Minn.), 273 N. W. 703.*

Workmen's Compensation Acts: Cerebral Hemorrhage in Relation to Arteriosclerosis and Strain.—Morris, a well-driller, was arteriosclerotic. During the course of his employment he was subjected to a severe strain and collapsed. He died several hours afterward. The industrial accident board of Texas awarded his widow compensation but the district court set aside the award. The widow then appealed to the court of civil appeals of Texas, El Paso.

The physician who attended Morris testified that the strain and exertion of Morris's work at the time he was stricken contributed to and caused the cerebral hemorrhage from the effects of which he died. The ruptured blood vessel in Morris's brain, said the court, accelerated or caused by the exertion and strain of the work in which he was engaged at the time he was stricken, constituted an accidental injury within the purview of the compensation act of Texas and was compensable. The court thought it to be immaterial that Morris had a pre-existing arteriosclerosis which rendered him more susceptible to a cerebral hemorrhage than an ordinary healthy person. The judgment of the district court denying the widow compensation was reversed and the cause remanded.—*Hurd v. Republic Underwriters (Texas), 105 S. W. (2d) 428.*

Optometry: Right of Corporation to Practice.—In the opinion of the Supreme Court of Arkansas, the Arkansas optometry practice act does not prohibit a corporation from practicing optometry through the agency of persons who are duly licensed to practice. Optometry, said the court, is not a learned profession but is a mechanical one requiring skill, manual dexterity and knowledge of the use and application of certain mechanical instruments. Its nature is empirical rather than learned. To designate optometry as a profession, as the Arkansas optometry practice act does, does not imply that it is a learned profession and there is no public policy forbidding commercialization of optometry as there is in law and medicine, which are true learned professions.

The Arkansas optometry practice act was passed because the legislature believed it an aid to public health. The benefit was intended for the public and not for optometrists. This being the case, there can be no argument that the public health would be conserved by the services of an optometrist working for himself and not by one working for another. The Supreme Court accordingly denied an injunction sought by the state, on the relation of the attorney general, to prohibit the defendant corporation from practicing optometry.—*State ex rel. Atty. Gen. v. Gus Blass Co. (Ark.) 105 S. W. (2d) 853.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, Apr. 19-21. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
American Association for Thoracic Surgery, Atlanta, Ga., Apr. 4-6. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.
American Association of Anatomists, Pittsburgh, Apr. 14-16. Dr. George W. Corner, 260 Crittenden Blvd., Rochester, N. Y., Secretary.
American Association of Genito-Urinary Surgeons, Atlantic City, N. J., May 2-4. Dr. Henry L. Sanford, 1621 Euclid Ave., Cleveland, Secretary.
American Association of Pathologists and Bacteriologists, Atlantic City, N. J., May 3-4. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.
American Association of the History of Medicine, Atlantic City, N. J., May 2. Dr. E. J. G. Beardsley, 1919 Spruce St., Philadelphia, Secretary.
American Association on Mental Deficiency, Richmond, Va., Apr. 20-23. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
American Bronchoscopic Society, Atlantic City, N. J., Apr. 30. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
American College of Physicians, New York, Apr. 4-8. Mr. E. R. Loveland, 4200 Pine St., Philadelphia, Executive Secretary.
American Gastro-Enterological Association, Atlantic City, N. J., May 2-3. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.
American Laryngological Association, Atlantic City, N. J., May 2-4. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.
American Laryngological, Rhinological and Otological Society, Atlantic City, N. J., Apr. 27-29. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
American Neurological Association, Atlantic City, N. J., May 2-6. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
American Orthopedic Association, Atlantic City, N. J., May 3-5. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
American Physiological Society, Baltimore, Mar. 30-Apr. 2. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.
American Society for Clinical Investigation, Atlantic City, N. J., May 2. Dr. J. M. Hayman Jr., 2065 Adelbert Road, Cleveland, Secretary.
American Society for Experimental Pathology, Baltimore, Mar. 30-Apr. 2. Dr. Paul R. Cannon, University of Chicago, Chicago, Secretary.
American Society for Pharmacology and Experimental Therapeutics, Baltimore, Mar. 30-Apr. 2. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
American Society of Biological Chemists, Baltimore, Mar. 30-Apr. 2. Dr. H. A. Mattill, Chemistry Bldg., State University of Iowa, Iowa City, Secretary.
American Surgical Association, Atlantic City, N. J., May 2-4. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.
American Therapeutic Society, New York, Apr. 1-2. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.
Arizona State Medical Association, Tucson, Apr. 21-23. Dr. D. F. Harbridge, 15 East Monroe St., Phoenix, Secretary.
Arkansas Medical Society, Texarkana, Apr. 18-20. Dr. W. R. Brooksher, 602 Garrison Ave., Ft. Smith, Secretary.
Association of American Physicians, Atlantic City, N. J., May 3-5. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
California Medical Association, Pasadena, May 9-12. Dr. F. C. Warnshuis, 450 Sutter Street, San Francisco, Secretary.
Conference of State and Provincial Health Authorities of North America, Washington, D. C., Apr. 9-11. Dr. A. J. Chesley, Minnesota State Office Bldg., St. Paul, Secretary.
Congress of American Physicians and Surgeons, Atlantic City, N. J., May 3-4. Dr. John T. King Jr., 1210 Eutaw Place, Baltimore, Secretary.
District of Columbia, Medical Society of the, Washington, May 4-5. Dr. C. B. Conklin, 1718 M St. N.W., Washington, Secretary.
Federation of American Societies for Experimental Biology, Baltimore, March 30-April 2. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
Florida Medical Association, Miami, May 9-11. Dr. Shaler Richardson, 111 W. Adams St., Jacksonville, Secretary.
Georgia, Medical Association of, Augusta, Apr. 26-29. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
Iowa State Medical Society, Des Moines, May 11-13. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
Kansas Medical Society, Wichita, May 9-12. Mr. C. G. Munns, 112 West Sixth St., Topeka, Executive Secretary.
Louisiana State Medical Society, New Orleans, May 2-4. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 26-27. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.
Mississippi State Medical Association, Jackson, Apr. 19-21. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
Missouri State Medical Association, Jefferson City, May 2-4. Dr. E. J. Goodwin, 634 N. Grand Blvd., St. Louis, Secretary.
Nebraska State Medical Association, Lincoln, Apr. 26-28. Dr. R. B. Adams, Center-McKinley Bldg., Lincoln, Secretary.
New York, Medical Society of the State of, New York, May 9-12. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, May 2-4. Dr. T. W. M. Long, Roanoke Rapids, Secretary.
Ohio State Medical Association, Columbus, May 11-12. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.
Oklahoma State Medical Association, Muskogee, May 9-11. Dr. L. S. Willour, Third and Seminole, McAlester, Secretary.
Philippine Islands Medical Association, Zamboanga City, Apr. 19-22. Dr. A. S. Fernando, 817 Taft Ave., Manila, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 30. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
South Dakota State Medical Association, Huron, May 9-11. Dr. Clarence E. Sherwood, 1021½ Egan Ave. S., Madison, Secretary.
Tennessee State Medical Association, Nashville, Apr. 12-14. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.
Texas, State Medical Association of, Galveston, May 9-12. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

V 1
193

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

15: 1-128 (Jan.) 1938

Significance of Rheumatic Activity in Chronic Rheumatic Heart Disease: Part I. Intensity and Extent. I. R. Juster, Glens Falls, N. Y.—p. 1.

Precipitating Causes of Congestive Heart Failure. W. A. Sodeman and G. E. Burch, New Orleans.—p. 22.

*Relation of Myocardial Disease to Abnormalities of Ventricular Complex of Electrocardiogram. H. E. B. Pardee and L. Price, New York.—p. 28.

Observations on Cardio-Accelerator Reflex from Stimulation of Skin Temperature Receptors. S. Benson, Chicago.—p. 45.

Calcified Nodular Deformity of Aortic Valve. B. J. Clawson, J. F. Noble and N. H. Lufkin, Minneapolis.—p. 58.

Influence of Size of Cardiac Infarcts on Electrocardiogram. H. Gold, W. Modell and Janet Travell, New York.—p. 77.

Respiratory Changes Produced in Cardiac Patient by Rebreathing Experiments as Compared with Those of Normal Individual. H. Landt and J. E. Benjamin, Cincinnati.—p. 83.

*Electrocardiographic Changes Following Inhalation of Tobacco Smoke. A. Graybiel, Boston; R. S. Starr, Hartford, Conn., and P. D. White, Boston.—p. 89.

Electrical Alternans Occurring in Case with Pericardial Effusion. L. Feldman, Chicago.—p. 100.

Myocardial Disease and Abnormalities of Ventricular Complex.—To determine the reliability of electrocardiographic evidence in diagnosing morphologic changes in the ventricular myocardium, Pardee and Price review sixty cases in which electrocardiographic records were made shortly before death and neither digitalis nor quinidine had been administered recently enough to influence the record. In seven of thirteen cases in which the ventricular complex was normal, a normal myocardium was found. In the other six there were slight morphologic changes. In nine of forty-seven cases in which the ventricular complexes were abnormal, a normal myocardium was found. The abnormal features of the electrocardiograms in these nine cases were similar to those found in other cases in which slight or moderate pathologic changes existed in the myocardium. In the other cases in which the ventricular complexes were abnormal there were definite myocardial changes. When the electrocardiographic abnormality involved only the QRS group, the T wave being normal, there were found only slight or moderate myocardial changes. When the T wave was abnormal, with or without QRS abnormality, there was a great range in the extent and the degree of the myocardial changes discovered. A frequent but not constant association was seen between the coronary T wave and focal myocardial lesions. There was a constant association between an elevated or depressed ST interval and the finding of areas of acute myocardial degeneration, though not always with areas of infarction. Right bundle branch block occurred twice without morphologic myocardial changes being discovered and three times with such changes. Left bundle branch block occurred twice, each time associated with myocardial changes.

Electrocardiographic Changes and Inhalation of Tobacco Smoke.—Their interest in the effect of tobacco on the electrocardiogram was stimulated by observations on a healthy young man 18 years of age who complained of dizziness on smoking. Electrocardiograms taken after the inhalation of tobacco smoke showed well marked inversion of the T waves in leads 2 and 3, while at other times the T waves were upright and of normal amplitude. To determine whether or not this is a common phenomenon, Graybiel and his collaborators carried out similar tests on forty-five persons of varying ages, some with heart disease, during the inhalation of tobacco smoke. Thirty-nine of the forty-five patients exhibited on smoking an increase in cardiac rate which averaged thirteen a minute; twenty-four of thirty-one tested showed an increase in arterial blood pressure which averaged 13 mm. of mercury systolic and 7 mm. diastolic. Lowering or inversion of the T waves occurred during the test in fifteen. The probable explanation for the changes in the T wave lies in the characteristic action of nicotine on the cardiac ganglions. Actually the changes in the T wave following smoking were found to be similar to those following atropinization. It is suggested that in those occasional instances in which attacks of angina pectoris are precipitated by smoking (tobacco angina) the attacks are not the result of coronary vasoconstriction but of a sudden increase in the work of the heart as shown by the increase in blood pressure or cardiac rate, or both.

American Journal of Anatomy, Philadelphia

62: 179-312 (Jan.) 1938

Studies of Living Muscles: I. Growth, Injury and Repair of Striated Muscle, as Revealed by Prolonged Observations of Individual Fibers in Living Frog Tadpoles. C. C. Speidel, Charlottesville, Va.—p. 179.

Variations Produced in Bones of Growing Rats by Parathyroid Extracts. R. B. Burrows, New Haven, Conn.—p. 237.

Length of Organ of Corti in Man. Mary Hardy, Baltimore.—p. 291.

American Journal of Cancer, New York

32: 1-162 (Jan.) 1938

Arrhenoblastoma: Malignant Ovarian Tumor Associated with Endocrinologic Effects. E. H. Norris, Minneapolis.—p. 1.

Bacteriologic Study of Mouse Tumors: II. Bacterial Immunity and Tumor Growth: Effect of Bacterial Products on Tumors. M. J. Eisen, Milan, Italy.—p. 30.

Immunity Reactions of Heterotransplantable Mouse Carcinoma Propagated in Rats for Seven Years. J. Putnoky, Budapest, Hungary.—p. 35.

Relation of Hypophysis to Growth of Malignant Tumors: IV. Study of Influence of Nutritional Factors on Walker Tumor 256 in Relation to Effect of Hypophysectomy. H. A. Ball and L. T. Samuels, San Diego, Calif.—p. 50.

*Incidence of Metastasis of Malignant Tumors to Adrenals. D. A. Glomset, Chicago.—p. 57.

Chemical Studies on Tumor Tissue: VI. Comparative Effects of Serum Colloids and of Salts on Swelling of Mouse Tumor Cells in Vitro. M. Belkin and M. J. Shear, Boston.—p. 62.

Production of Epithelial Tumors by Combination of Beta Radiation and Painting with Benzpyrene. J. C. Mottram, London, England.—p. 76.

Incidence of Spontaneous Tumors of Mice of CBA Strain After Change of Diet: Preliminary Report. L. C. Strong, New Haven, Conn.—p. 80.

Incidence of Spontaneous Tumors in Female Mice (Breeders) of the CBA Strain. L. C. Strong, New Haven, Conn.—p. 85.

Study of Growth of Cysticercus Sarcomas 4337 and 4338 from Grafts of Each Tumor Simultaneously Transplanted in Subcutaneous Tissues of Same Hosts. W. F. Dunning, M. R. Curtis and F. D. Bullock, New York.—p. 90.

Uterine Cancer in the Rabbit. J. W. Orr and C. J. Polson, Leeds, England.—p. 114.

Effect of Extracts of Different Organs and Tissues on Viability of Transplantable Tumors. K. Sugiura, New York.—p. 126.

Incidence of Metastasis to Adrenals.—Glomset compares the relative susceptibility of the adrenals to metastases with other organs having a similar blood supply. His material consists of 4,000 consecutive necropsies performed by the staff of the Department of Pathology of the University of Chicago up to and including 1936. Of the 4,000 necropsies, 821 showed evidence of malignant neoplastic growth and in 445 of these there were organic metastases. In 275 cases (34 per cent of all malignant tumors) there was metastasis to the liver. Forty-six per cent of these metastases, however, came from tumors the primary site of which was in the portal area. In addition, metastasis to the lung occurred in 224 cases, to the adrenals in 110 cases, to the kidneys in forty-nine cases and to the spleen in thirty. Although the kidneys, spleen and adrenals are situated close together and have a similar blood supply, the adrenals have more metastases than either the spleen or the kidneys, despite their much smaller size. Of all organically metastasizing tumors, 24.7 per cent metastasized to the adrenals. The high incidence of tumors which metastasize to the adrenals that have their primary site in the lung and breast, or in a malignant melanoblastoma, leads one to surmise that most adrenal metastases are blood borne. These figures are in accord with those of Willis, which show that adrenal

110
938

metastases are most commonly bilateral but, when unilateral, are more prevalent in the left than in the right gland. Tumors which only occasionally metastasize to the adrenals are those of the gastro-intestinal tract and the pelvic organs.

American J. Digest. Dis. & Nutrition, Fort Wayne, Ind.

4: 705-786 (Jan.) 1938

Ulcer Recurrences Attributed to Upper Respiratory Tract Infection: Possible Illustration of Shwartzman Phenomenon. B. B. Crohn and G. Shwartzman, New York.—p. 705.
Studies in Mucous Membrane Hypersensitiveness: III. Allergic Reaction of Passively Sensitized Rectal Mucous Membrane. I. Gray and M. Walzer, Brooklyn.—p. 707.
Secondary Effects of Radiation on Rectum Following Treatment of Extrarectal Pelvic Lesions. L. K. Ferguson, Philadelphia.—p. 712.
Deficiency States Associated with Gastro-Intestinal Disease. D. L. Wilbur and A. M. Snell, Rochester, Minn.—p. 720.
Diarrhea of Pancreatic Insufficiency. J. A. Bargen, J. L. Bollman and E. J. Kepler, Rochester, Minn.—p. 728.
Diagnosis and Treatment of Acute Nonhemorrhagic Pancreatitis. R. Elman, St. Louis.—p. 732.
*Back Pain in Lesions of Gastro-Intestinal Tract, with Particular Reference to Duodenal Ulcer. W. J. Mixter, Boston.—p. 736.
Acute Abdominal Pain from Upper Urinary Tract Lesions. A. Randall and B. Hughes, Philadelphia.—p. 739.
Intubation Studies of Human Small Intestine: VII. Factors Concerned in Absorption of Glucose from Jejunum and Ileum. W. O. Abbott, W. G. Karr and T. G. Miller, Philadelphia.—p. 742.
Deposition of Glycogen in Normal and in Experimentally Damaged Livers After Oral and Intravenous Administration of Dextrose. T. L. Althausen, with technical assistance of M. Stockholm, San Francisco. —p. 752.

Back Pain in Lesions of Gastro-Intestinal Tract.—Mixter reports seven cases of duodenal ulcer in which the main symptom was pain in the back with little or nothing that would suggest a lesion of the duodenum. Pain in the back or pain radiating about the chest may be the only sign in duodenal ulcer, even in extensive perforating ulcer of the posterior wall of the duodenum.

American Journal of Ophthalmology, St. Louis

21: 1-120 (Jan.) 1938

Return of Vision and Other Observations in Grafted Vertebrate Eyes. L. S. Stone, New Haven, Conn.—p. 1.
Indirect Traumatic Optic Atrophies. M. Davidson, New York.—p. 7.
Clinical Significance of Retinal Changes in Hypertensive Toxemias of Pregnancy. G. G. Gibson, Philadelphia.—p. 22.
Leukemic Infiltration of Retina and Choroid in an Infant Treated by X-Ray. B. Y. Alvis, St. Louis.—p. 31.
Experimental Studies of Effect on Retinal Blood Pressure and Intra-Ocular Tension of Pressure Applied to Eyeball. E. L. Bulson, Fort Wayne, Ind.—p. 34.
Keratoconus: Report of Five Cases. W. M. Dodge Jr., Battle Creek, Mich.—p. 40.
*Sulfanilamide in Ophthalmology: Report of Case. M. Goldenburg, Chicago.—p. 54.

Sulfanilamide in Ophthalmology.—Goldenburg saw a virulent case of orbital cellulitis, apparently of metastatic origin. Because of the history elicited and the clinical picture presented, he concurred in the continuation of the use of sulfanilamide and even when the patient showed moderate cyanosis urged an increase in its administration. The outcome was favorable. The primary lesion (a pimple) was on the left side of the face, followed by parotitis of the right side, which became marked; and although parotitis also developed later on the left side, it was comparatively moderate. This was followed by edema of the lids and proptosis of the right eye, which became very marked. The chemosis of the conjunctiva during the height of the proptosis was moderate, but as the lids became less taut the bulbar conjunctiva increased in chemosis, which, however, did not persist very long. The fundus of the right eye when first seen was peculiar in that the disk appeared paler than normal, and later as the proptosis decreased it became redder and at a still later date intensely red. The papilledema of the left eye, at first only moderate, increased as the patient apparently improved, reaching a height of about 4 diopters and disappearing slowly. At no time was the left eye involved externally. Complete muscular function returned in the right eye with the exception of a barely noticeable ptosis of the upper lid. The patient states that he sees as well as usual. Although the author disagreed with the consultants in the diagnosis and the patient made an excellent recovery, it is not beyond the sphere of possibility that they were correct and that the case was one of those rare instances of cavernous sinus thrombosis in which recovery does occur. This might be attributed to the action of the sulfanilamide. Although the patient became mildly cyanotic, it was presumed that this condition was due to the medication; but in view of the lack of evidence of pathologic changes of the erythrocytes the drug was pushed further and the cyanosis soon disappeared.

American Journal of Physiology, Baltimore

121: 1-310 (Jan.) 1938. Partial Index

Chemoreflex Control of Vascular Reactions Through Carotid Body. T. Bernthal, Ann Arbor, Mich.—p. 1.
Response of Sensorimotor Cortex to Stimulation of Peripheral Nerve. S. H. Bartley and P. Heinbecker, St. Louis.—p. 21.
Reflex Responses of Nictitating Membrane and Blood Pressure to Distention of Bladder and Rectum. A. L. Watkins, Boston.—p. 32.
Time Relations of Response to Repeated Water Ingestion. H. L. White, St. Louis.—p. 40.
Some Effects of Zinc and Iron Salts on Hypoglycemic Action of Insulin in Rats. N. R. Blatherwick, Mary E. Ewing and Phoebe J. Bradshaw, New York.—p. 44.
*Total Urinary Estrogen. Estrone and Estriol During Menstrual Cycle and Pregnancy. G. Van S. Smith, O. W. Smith and G. Pincus, Brookline, Mass.—p. 98.
Muscular Efficiency in Relation to Taking of Food and to Height of Respiratory Quotient Immediately Before Exercise. J. Haldi, G. Bachmann, C. Ensor and W. Wynn, Emory University, Ga.—p. 123.
Study of Mechanism Whereby Coitus Excites Ovulation Producing Activity of Rabbit's Pituitary. C. M. Brooks, Baltimore.—p. 157.
Increased Sodium Chloride Appetite in Pregnant Rats. B. Barelare Jr. and C. P. Richter, Baltimore.—p. 185.
Adrenals and Gonads of Rats Following Thyroidectomy Considered in Relation to Pituitary Histology. Isolde T. Zeckwer, Philadelphia.—p. 224.
Study of Protein Anabolism and Catabolism on Nitrogen-Free Diet. W. H. Seegers, Yellow Springs, Ohio.—p. 231.
Some Effects of Acute Anemia on Transmission of Impulses Through Sympathetic Ganglion. D. Bargeton, Boston.—p. 261.
Existence of Secretory Nerves in Vagi for and Reflex Excitation and Inhibition of Bile Secretion. C. A. Tanturi and A. C. Ivy, Chicago. —p. 270.
Factors Influencing Concentrations of Serum Protein, Chloride and Total Fixed Base of Dog During Exercise. F. W. Schlutz and Minerva Morse, Chicago.—p. 293.

Urinary Estrogens During Menstrual Cycle.—The Smiths and Pincus comment on the "total" estrogenic potency of urine collected through a menstrual cycle and a pregnancy in a woman aged 27. This has been quantitatively measured by bio-assay after the use of two different methods of hydrolysis and extraction. The two technics yielded similar curves for "total" estrogen throughout the menstrual cycle, the Cohen and Marrian, however, giving significantly higher values during the latter half than the method of the Smiths. Similar curves for "total" estrogen were also found by both methods during a gestation. In 60 per cent of the pregnancy urines, however, the technic of the Smiths gave significantly higher values than those resulting from the technic of Cohen and Marrian. This difference was demonstrated to be due to the chance for loss in the Cohen and Marrian extraction and separation of theelin and theelol in pregnancy urines. The separation of theelin and theelol in the menstrual cycle revealed that (1) more theelin than theelol was present throughout, (2) more theelol was excreted during the luteal phase than during menstruation and the period of follicle ripening, (3) a rise in theelin accompanied the onset of menstruation and (4) the theelin to theelol ratio was twice as high during the first two days of both catamenias followed as at any other time. The separation of theelin and theelol through pregnancy revealed that (1) the only specimen which contained more activity in the theelin than in the theelol fraction was collected at the time of the second missed catamenia when the patient had been put to bed for flowing, (2) theelol was in the ascendency for the rest of the pregnancy, its rate of increase being greater than that of theelin to the last month, (3) false labor twelve days before delivery was accompanied by a marked rise in both theelin and theelol, the ratio of the two remaining unchanged and (4) labor and delivery were accompanied by a drop in theelol and a rise in theelin so that the ratio of theelol to theelin was lower than it had been at any time since the second month. Comparison of colorimetric with bio-assay on the pregnancy urines from the fourth month on suggested the presence of some estrogen in addition to theelin and theelol and more active than either (estradiol).

V 1
193

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

22: 1-132 (Jan.) 1938

Effect of Sulfanilamide on Gonococci: Experimental Study. A. Cohn, New York.—p. 1.

*Effect of Administration of Theelin on Course of Experimental Rabbit Syphilis. J. E. Kemp and C. Shaw, with technical assistance of Elsie Mae Fitzgerald, Chicago.—p. 9.

Micromodification of Eagle Flocculation Technic. H. Eagle, Baltimore, and A. F. Brand, Fayetteville, N. Y.—p. 22.

Evaluation of Complement Fixation Test for Gonorrhea. A. Jacoby, M. Wishengrad and J. Koopman, New York.—p. 32.

Fever Therapy in Gonococcic Infections, with Especial Reference to Gonococcic Arthritis. T. G. Schnabel and F. Fetter, Philadelphia.—p. 39.

Fever Therapy in Gonococcic Infections. J. A. Trautman, H. V. Stroupe and D. J. Devlin, New Orleans.—p. 48.

Comparison of Results of Smear and Cultural Methods for Diagnosis of Gonococcic Infections in Adult Females. C. M. Carpenter, Alice D. Leahy and K. M. Wilson, Rochester, N. Y.—p. 55.

Multiple Test Method for Routine Use in Serodiagnosis of Syphilis: Report of 7,091 Tests Performed on 3,000 Consecutive Blood Specimens. L. F. Pierce, H. A. Patterson, Rose A. Stevenson and H. C. Torbert, Los Angeles.—p. 59.

*Treatment of Syphilis in Tuberculous Patients: Preliminary Report. C. R. Smith, Northville, Mich.—p. 72.

Early Treatment of Acquired Syphilis. E. Hoffmann, Bonn/Rh., Germany.—p. 82.

Administration of Theelin in Experimental Syphilis.—Kemp and his associates compared the course of experimental syphilis in twelve male rabbits treated with theelin, twelve normal males used as controls, thirteen female animals treated with theelin and fourteen normal females used as controls. All the animals were inoculated on granulating wounds on the back twelve to fifteen days old by massaging into them 0.15 cc. of an emulsion of a testicular syphiloma containing from three to five spirochetes per high power darkfield. The animals were observed for an average of 157 days after inoculation and thirty-five days after treatment ended. The administration of theelin in amounts sufficient to keep female rabbits in continual estrus modified the course of the syphilitic infection in male rabbits until its severity approached the severity of the infection in normal female rabbits. The comparatively milder course of the infection in female than in male rabbits was modified still further by the administration of theelin. In female rabbits the beneficial effects of theelin on the course of the syphilitic infection was more apparent than it was in male animals treated with theelin. These observations and those of Frazier suggest that the estrogenic substance might be one of the factors responsible for the modified course of the syphilitic infection in the pregnant and its milder course in the nonpregnant female.

Treatment of Syphilis in Tuberculous Patients.—Smith comments on the results of 2,776 antisyphilitic treatments as related to pulmonary tuberculosis given to sixty-nine tuberculous patients. The patients received one or more drugs, principally bismuth arsphenamine sulfonate, neoarsphenamine, mapharsen and sodium bismuth thioglycollate. In most of the earlier patients of the group the treatment of syphilis was intentionally inadequate because of the fear that tuberculosis would be made worse. The dose has been gradually increased, and the later treatment may be considered adequate. The results show that progressive tuberculosis is not more frequent in the treated syphilitic patients than in similar groups of nonsyphilitic tuberculous patients and that treatment of syphilis lessens the frequency of progressive tuberculosis. The results justify adequate treatment of syphilis in tuberculous patients.

Annals of Medical History, New York

10: 1-106 (Jan.) 1938

Hunter Holmes McGuire. S. McGuire, Richmond, Va.—p. 1.

George Ben Johnston. J. M. Hutcheson, Richmond, Va.—p. 15.

Cesarean Section in Virginia in the Preaseptic Era, 1794-1879. J. L. Miller, Thomas, W. Va.—p. 23.

Dr. John Peter Mettauer: An Early Southern Gynecologist. P. Rucker, Richmond, Va.—p. 36.

Thomas Jefferson's Influence on the Foundation of Medical Instruction at the University of Virginia. A. D. Hart Jr., University, Va.—p. 47.

Pioneer Medicine in Virginia. B. P. Seward, Roanoke, Va.—p. 61.

The "Scotch-Irish" of the Valley of Virginia and Their Influence on Medical Progress in America. H. H. Trout, Roanoke, Va.—p. 71.

Medicine and Shockoe Hill. H. J. Warthen, Richmond, Va.—p. 83.

Development of Psychiatry and Neurology in Virginia. B. R. Tucker, Richmond, Va.—p. 91.

Archives of Neurology and Psychiatry, Chicago

39: 219-432 (Feb.) 1938

Sakel's Pharmacologic Shock Treatment for Schizophrenia: Tentative Directions and System of Recording. J. P. Frostig, Warsaw, Poland; translated by J. Wortis, New York.—p. 219.

*Protamine Zinc Insulin: Its Unsuitability for Hypoglycemic Shock Therapy. H. H. Reese, Madison, Wis., and A. Vander Veer, Chicago.—p. 232.

Hypoglycemia: Neurologic and Neuropathologic Studies. F. P. Moersch and J. W. Kernohan, Rochester, Minn.—p. 242.

Results of Treatment of Athetosis by Section of Extrapyramidal Tracts in Spinal Cord. T. J. Putnam, Boston.—p. 258.

Oxygen and Carbon Dioxide Contents of Arterial and Venous Blood of Schizophrenic Patients. J. M. Looney and H. Freeman, Worcester, Mass.—p. 276.

Lipoid Content of Blood in Deficiency Diseases and During Demyelinization of Nervous System. E. F. Gildea, New Haven, Conn.—p. 284.

*Cerebral Dysrhythmias of Epilepsy: Measures for Their Control. F. A. Gibbs, E. L. Gibbs and W. G. Lennox, Boston.—p. 298.

*Neural Correlations of Vision and Their Significance for Localization of Tumors of the Brain: Preliminary Report. C. A. Elsberg and H. Spotnitz, New York.—p. 315.

Contribution to Problem of Cutaneous Localization in Man. E. Gellhorn, J. Mehlman and M. Kaplan, Chicago.—p. 327.

Prepsychotic Personality of Patients with Agitated Depression. W. B. Titley, New York.—p. 333.

Familial Neurosyphilis of Dementia Paralytica Type. W. C. Menninger and M. Grotjahn, Topeka, Kan.—p. 343.

Studies in Diseases of Muscle: III. Metabolism of Creatine and Creatinine in Myasthenia Gravis, Including a Study of Excretion of Nucleosides and Nucleotides. A. T. Milhorat and H. G. Wolff, New York.—p. 354.

Protamine Zinc Insulin.—Reese and Vander Veer treated nine patients with schizophrenia for more than a month. Each of them received from thirteen to nineteen intramuscular injections of protamine zinc insulin. The insulin dose was begun with 40 units daily in most cases and was raised in steps of 10 units. Most of the patients received a maximal dose of 120 units, but this was continued for only two or three days. They hoped that the slow action of protamine zinc insulin might enable them to induce and maintain long-continued hypoglycemic states of high therapeutic effect minus some or all of this dramatic symptomatology. They abandoned the method after a month and returned to the use of regular insulin. The effects of equal doses of protamine zinc insulin are not always the same; the dose must be constantly varied, since no uniform shock dose can be established; closer laboratory cooperation, with frequent determinations of the blood sugar, is required with this compound than with regular insulin; the danger of aftershock is greater, and epileptiform shocks are somewhat more frequent. Shock therapy with protamine zinc insulin differs from that with regular insulin, since with large doses the fasting (morning) sugar level declines steadily and it is almost impossible to produce comatose, wet shock. The comatose phase of insulin shock depends on the rate of fall of the blood sugar as well as on the level reached.

Cerebral Dysrhythmias of Epilepsy.—The Gibbses and Lennox have electro-encephalograms for more than 400 patients with daily records for some; others were studied at long intervals and others for long periods, the longest thirty-four hours. Their conclusions are: 1. Epilepsy is the expression of improper functioning of the rhythm-regulating mechanisms of the brain. 2. Abnormalities of rhythm are common to all parts of the nervous system. 3. In certain portions of the cortex they can be correlated with certain clinical types of epilepsy; a fast rhythm spells grand mal, a slow rhythm psychomotor and an alternating slow and fast rhythm petit mal epilepsy. 4. The symptoms which accompany abnormal electrical activity depend on the function of the area or areas of the brain involved, the rapidity of the rhythm (high frequencies producing overactivity and slow frequencies underactivity) and the amplitude of the activity, for on this will depend the intensity of the symptoms. 5. The rate of both normal and abnormal rhythms can be altered by the administration of certain drugs and by changes in the physiologic reactions of the body. 6. In a case in which the abnormal rhythms were present only in sleep and were confined to the frontal area, the anterior portions of both frontal lobes were removed, with subsequent virtual disappearance of abnormal rhythms and great improvement in seizures.

Correlation of Vision and Localization of Cerebral Tumors.—Believing that functional visual tests might be of value for the localization of tumors of the brain, Elsberg and

Spotnitz carried out such tests in fifty persons suspected of intracranial tumors after a large number of investigations were made on healthy persons. It appears that: 1. In cases of supratentorial tumor the duration of the refractory period after stimulation by continuous light is longer in the eye contralateral to the affected hemisphere. 2. When the lesion is in the frontal lobe the duration of the refractory period after stimulation of the homolateral eye with flickering light is longer than that after continuous stimulation of the same eye. 3. When the lesion is in the parietal or the occipital lobe, the duration of the refractory period after stimulation of the homolateral eye with flickering light is shorter than that after continuous stimulation of the same eye.

Archives of Otolaryngology, Chicago

27: 1-142 (Jan.) 1938

Otitic Sinus Thrombosis. J. M. Sutherland, Detroit.—p. 1.
Osteomyelitis of the Mandible. T. E. Carmody, Denver.—p. 35.
Cartilage Transplanted Beneath Skin of Chest in Man: Experimental Studies with Sections of Cartilage Preserved in Alcohol and Buried from Seven Days to Fourteen Months. L. A. Peer, Newark, N. J. —p. 42.
Effect of Limited Cochlear Lesions on Cochlear Potentials and Middle Ear Muscle Reflexes. H. G. Kobrak, J. R. Lindsay, H. B. Perlman and H. Dubner, Chicago.—p. 59.
*Infection of Blood Stream: Medical Treatment, with Especial Reference to Transfusions of Immunized Blood; Report of Cases. E. G. Gill, Roanoke, Va.—p. 67.
Further Studies in Hydrogen Ion Concentrations of Nasal Secretions. Catherine C. Buhrmester, Nashville, Ill.—p. 83.
Gangrenous Osteomyelitis of Paranasal Sinuses: Case. A. Lewy, Chicago.—p. 91.
Functional Examination of Hearing. R. Sonnenschein and N. Leshin, Chicago.—p. 97.

Infection of Blood Stream.—Gill declares that successful therapy depends on early and adequate intravenous administration of immunized blood, polyvalent antistreptococcus serum, solutions of dextrose and sodium chloride and sulfanilamide or its derivatives. Transfusions of whole blood from a donor convalescent from surgical streptococcic infection is more desirable than therapy with scarlet fever serum. The duration of immunity in compatible convalescent donors is not known. The surgeons of the hospitals of each city should make a permanent record of patients who have recovered from infection of the blood stream and secure permission for grouping, thus making them available as donors for emergency transfusions. Certain general measures, such as adequate feeding, rest, stimulants and proper elimination by the bowels and kidneys, must be carefully outlined from day to day.

Illinois Medical Journal, Chicago

73: 1-88 (Jan.) 1938

Value and Limitations of Encephalography in Children. A. Levinson, Chicago.—p. 21.
*Bronchoscopy in Bronchial Asthma. A. H. Andrews Jr., Chicago.—p. 25.
Clinical Problems in Diabetes. R. W. Keeton, Chicago.—p. 31.
Typhoid Carrier Control in Illinois. G. H. Gowen, Champaign.—p. 38.
Surgical Pathology of Tumors of the Breast. R. B. Malcolm, Chicago. —p. 43.
X-Ray Therapy in Cancer of the Breast. J. T. Case, Chicago.—p. 46.
Icterus in the New-Born. C. D. Butler, Oak Park.—p. 50.
Experience with "Periodicity" Method of Roentgentherapy in Treatment of Buccopharyngeal Carcinoma. A. Brunschwig and D. Tschetter, Chicago.—p. 54.
*Mucoceles of Appendix. F. J. Jirka and C. S. Scuderi, Chicago.—p. 57.
Improved Postoperative Care. W. C. Bornemeier, Chicago.—p. 58.
Some Physical Aspects of Radiation Therapy. R. Landauer, Highland Park.—p. 64.
Heterotopic Independent Adenomyomatous Tumors of Female Pelvis. J. A. Graham and E. H. Bukofzer, Chicago.—p. 69.
Use of Dinitrophenol for Obesity Resulting in Absolute Blindness and Destruction of Both Globes. C. B. Welton, Peoria.—p. 72.
Diarrhea: Gastrocolic Fistula: Report of Seven Cases Based on 7,000 Proctoscopic Examinations. M. H. Streicher, Chicago.—p. 77.
Mortality Report of Department of Obstetrics and Gynecology of the University of Chicago Clinics and of the Chicago Lying-In Hospital May 25, 1931, to June 30, 1936. C. P. Huber and H. C. Hesseltine, Chicago.—p. 78.
Brain Pathology and Mental Alienation. B. Lemchen, Chicago.—p. 83.

Bronchoscopy in Bronchial Asthma.—Andrews states that the value of bronchoscopy in bronchial asthma is threefold: diagnostic, aspiration of secretion for vaccines, and therapeutic. Bronchoscopy is of diagnostic value in bronchial asthma because it is a means toward diagnosing the type of tracheobronchial changes and in differentiating asthma from other conditions. The value of bronchoscopic aspirated vaccines has been demonstrated repeatedly to be superior to sputum vaccines. The methods by which bronchoscopy relieves bronchial asthma may be listed as follows: removal of secretion, stretching and dilation of the bronchi, breaking into the vagus reflex arc and application of drugs. Aspiration of secretion is probably the most significant mechanism. The secretions which are blocking the airway and are of such a nature that they cannot be removed by cough and ciliary action are aspirated. The removal of these secretions aids the defensive and reparative processes of the mucosa, causing an improvement in the bronchitis with subsequent lessening of the secretions. In cases complicated by pulmonary atelectasis, aspiration of the obstructing secretions causes an improvement in the atelectasis and the asthma. Bronchoscopic therapy is a symptomatic method of treatment and is only an adjunct to the allergic management and treatment. An exception to this might be those cases of intrinsic bacterial allergy of bronchitic origin in which bronchoscopy would have a therapeutic effect on the etiologic bronchitis. Of 235 cases reported in the literature, a favorable result was obtained in 78 per cent, temporary improvement in 3 per cent and no improvement in 17 per cent. The conditions that indicate a more favorable response are an onset associated with an infectious disease and secretion difficult of spontaneous removal. The conditions that indicate a poorer response are a small amount of secretion and a chronic catarrhal tracheobronchitis. The results are also poorer as the age of the patients and duration of the asthma increase.

Mucoceles of the Appendix.—Jirka and Scuderi define mucocele of the appendix as an accumulation of a mucous or mucoid secretion in either the lumen, the wall or the mesenteric attachment of the vermiform appendix. The postmortem records of the Cook County Hospital from January 1929 to January 1937 (9,180 cases) revealed only four instances, or 0.043 per cent. From July 1928 to January 1937, among 9,535 surgically removed appendixes there were twenty-two (0.23 per cent) instances of mucocele. The reports of other investigators give an incidence of from 0.2 to 0.68 per cent. Occlusion of a portion of the appendical lumen with holding back of the glandular secretion is probably the underlying cause. When malignant changes occur, however, the pathologic appearance changes to one of a diffuse pseudomyxomatous peritonitis. The prognosis is good, with the exception of rare malignant changes, which as a rule are primarily ovarian tumors with secondary metastasis to the appendix.

Iowa State Medical Society Journal, Des Moines

28: 41-88 (Feb.) 1938

Polycythemia and Hypertension. E. V. Allen, Rochester, Minn.—p. 41.
Impacted Urethral Calculi Complicating Prostatism. W. K. Hicks, Sioux City, and L. F. Eaton, Schaller.—p. 45.
Expanding Scope of Transurethral Prostatic Resection by Means of Two Stage Operation. P. F. Olsen, Dubuque.—p. 47.
Typhus Fever in the United States. J. C. Barton, Independence.—p. 50.
Later Contributions to Treatment of Fractures. J. A. W. Johnson, Newton.—p. 52.

Johns Hopkins Hospital Bulletin, Baltimore

62: 1-90 (Jan.) 1938

Intermittent Blood Flow in Capillaries of Human Skin. J. Bordley 3d, M. H. Grow and W. B. Sherman, Baltimore.—p. 1.
Studies in Hemolytic Anemia: I. Hemolysis, Compensatory Regeneration and Erythroblastosis. H. W. Josephs, Baltimore.—p. 25.
*Id.: II. Presence of Antihemolytic Factor in Human Plasma. H. W. Josephs, Baltimore.—p. 53.
Id.: III. Pig's Plasma as Source of Antihemolytic Factor. H. W. Josephs and Perlina Winocur, Baltimore.—p. 70.
Inhibitory Effect of Sulfanilamide on Development of Experimental Tuberculosis in the Guinea Pig. A. R. Rich and R. H. Follis Jr., Baltimore.—p. 77.
Platelet-Reducing Substance in Spleen of Thrombocytopenic Purpura: Preliminary Report. C. E. Troland and F. C. Lee, Baltimore.—p. 85.

Antihemolytic Factor in Human Plasma.—Josephs studied the equilibrium between blood destruction and formation as measured by urobilin excretion in the stools and the reticulocyte count, the part played by erythroblastosis considered as a result of disturbance in erythropoiesis, the mechanism of the

V 1
193

crises in terms of an acute disturbance in the equilibrium between blood destruction and formation and the mechanism by which transfusion acts in hemolytic anemia. The most dramatic results of transfusion are seen in the acute cases, in which transfusion not infrequently appears to terminate the process abruptly; but even in the congenital or constitutional cases the total effect of transfusion transcends the immediate result of blood replacement. The principal measurable effect is on total urobilin excretion. The urobilin excretion in congenital hemolytic and sickle cell anemia is a measure of blood destruction; therefore it may be concluded that transfusions and injections of plasma concentrate are factors in the reduction of the amount of blood destruction. In the majority of cases the reduction in blood destruction was accompanied by a rise in red cells, but in some the red cells failed to rise, nor was the extent of the rise in red cells always parallel to the fall in urobilin excretion. This indicates the presence of other factors in these cases besides blood destruction. What these other factors are has not been ascertained, but they appear to be related to erythropoietic activity and especially to the presence of erythroblastosis. The variability in red cell response limits the therapeutic applications of the injections. The results indicate the possibility that in sickle cell and congenital hemolytic anemia something is lacking that is present in normal blood plasma. The effective substance has thus far been found in the ether-insoluble fraction of concentrated protein-free plasma and is effective in minute amounts.

Journal of Clinical Investigation, New York

17: 1-118 (Jan.) 1938

Chloride Depletion in Conditions Other Than Addison's Disease. A. W. Winkler and O. F. Crankshaw, New Haven, Conn.—p. 1.
*Effects on Cardiovascular System of Fluids Administered Intravenously in Man: I. Studies of Amount and Duration of Changes in Blood Volume. D. R. Gilligan, M. D. Altschule and Marie C. Volk, Boston. —p. 7.
Studies of Gonococcic Infection: III. Comparison of Bactericidal Properties of Synovial Fluid and Blood in Gonococcic Arthritis. W. W. Spink and C. S. Keefer, Boston.—p. 17.
Id.: IV. Effect of Mucin on Bacteriolytic Power of Whole Blood and Immune Serum. C. S. Keefer and W. W. Spink, Boston.—p. 23.
Renal Excretion of Endogenous Creatinine in Man: Comparison with Exogenous Creatinine and Inulin. B. F. Miller, New York, and A. W. Winkler, New Haven, Conn.—p. 31.
*Effect of Epinephrine in Circulatory Collapse Induced by Sodium Nitrite. R. W. Wilkins., S. Weiss and Florence W. Haynes, Boston.—p. 41.
Neutralization of Encephalitis Virus (St. Louis, 1933), by Serum. R. S. Muckenfuss, J. E. Smadel and Elizabeth Moore, St. Louis.—p. 53.
Respiratory Properties of Arterial Blood in Normal Man and in Patients with Disease of Liver: Position of Oxygen Dissociation Curve. A. Keys and A. M. Snell, Rochester, Minn.—p. 59.
Observations on Renal Threshold for Ascorbic Acid in Man. J. M. Faulkner and F. H. L. Taylor, Boston.—p. 69.
Distribution of Body Water and Electrolytes in Adrenal Insufficiency. H. E. Harrison and D. C. Darrow, New Haven, Conn.—p. 77.
Effect of Hyperthermia on Distribution of Water and Electrolytes in Brain, Muscle and Liver. H. Yannet and D. C. Darrow, New Haven, Conn.—p. 87.
Metabolism of Blood Pigments in Pernicious Anemia. K. Dobriner and C. P. Rhoads, New York.—p. 95.
Excretion of Coproporphyrin I Following Hemorrhage in Dogs. K. Dobriner and C. P. Rhoads, New York.—p. 105.
Influence of Epinephrine on Digital Arterioles of Man: Study of Vasoconstrictor Effects. T. J. Fatherree and E. V. Allen, Rochester, Minn. —p. 109.

Effects of Intravenous Fluids on Cardiovascular System.—Gilligan and his co-workers studied the changes in the blood volume and the effects on the dynamics of the circulation after the injection of isotonic and hypertonic fluids intravenously in forty-two subjects not suffering from shock, most of whom showed no evidences of dehydration or cardiac or renal insufficiency. Plasma and blood volumes were found increased immediately after the end of injection. In persons receiving a given volume of solution of given composition the greatest increases in blood volume were usually obtained after the faster rates of injection, and the lesser increases at the slower rates of injection. The average increases in plasma and blood volume were somewhat greater when the hypertonic solution of 5 per cent dextrose in physiologic solution of sodium chloride was given than after plain physiologic solution of sodium chloride. The percentage of the injected fluid present in the circulation decreased as the volume of fluid injected increased. After intravenous fluids, the forces which govern the escape of fluid from the circulation normally act to resist increases in blood volume of approximately more than 20 per cent. The plasma and blood volumes have been found appreciably increased up to approximately two hours after injections of 1,000 cc. of 0.85 per cent saline solution or of 5 per cent dextrose in 0.85 per cent saline solution at rates of 30 cc. per minute or greater. Uncomplicated operations do not cause an appreciable reduction in the blood volume as evidenced by the absence of change in hematocrit and concentration of serum protein after operation; the increase in blood volume after the intravenous injection of fluids was not influenced by such operations. Pulmonary congestion, which occasionally occurs after intravenous injections of fluid, may result from the rapid increase in blood volume. A subsequent paper will report the effect of these injections on arterial and venous pressures, the work of the heart and related aspects of the circulation.

Epinephrine in Circulatory Collapse Induced by Sodium Nitrite.—Wilkins and his associates studied the effect of epinephrine in vasomotor collapse induced by sodium nitrite in subjects in the upright position. Both in the horizontal and in the upright position, epinephrine in subcutaneous doses of 1 mg. caused arteriolar constriction in and decreased blood flow through the hand. The venous tone became increased, as did the arterial pulse pressure and the cardiac rate; the venous pressure was usually slightly elevated. Epinephrine did not prevent the vasomotor collapse and syncope produced by sodium nitrite, mainly because the arteriolar constriction and the tissue anoxia were enhanced and because the decreased venous tone produced by nitrite was not adequately compensated for. The experiments indicate that the level of the arterial pressure is not a reliable index of the clinical manifestations of vasomotor collapse or of the degree of tissue anoxia. The fact that epinephrine is ineffective in nitrite collapse does not rule out its efficacy in other types of collapse.

Journal of Urology, Baltimore

39: 1-80 (Jan.) 1938

Clinical Data Concerning Chronic Pyelonephritis. W. F. Braasch, Rochester, Minn.—p. 1.
Squamous Cell Carcinoma of Renal Pelvis: Case with Invasion of Duodenum. J. A. Lazarus, New York.—p. 34.
Gas Cysts of Urinary Bladder. H. A. Levin, New Haven, Conn.—p. 45.
*Peritoneal Lavage in Treatment of Uremia: Experimental and Clinical Study. J. B. Wear, I. R. Sisk and A. J. Trinkle, Madison, Wis.—p. 53.
Primary Retroperitoneal Leiomyosarcoma. E. K. Morgan and C. M. Stone, Brooklyn.—p. 63.
Extrarenal Extravasation Observed in Course of Intravenous Urography. P. A. Narath, New York.—p. 65.
*New Substitute for Ketogenic Diet. J. K. Narat, Chicago.—p. 75.
Local Use of Arsphenamines in Acute Gonorrheal Urethritis. J. E. Heslin and W. A. Milner, Albany, N. Y.—p. 77.

Peritoneal Lavage in Treatment of Uremia.—Wear and his colleagues made experimental studies on dogs in uremia to try to discover an efficient perfusing fluid that could be used in the human patient. They chose Hartmann's solution for the perfusion fluid. The procedure was carried out under morphine and pentobarbital sodium anesthesia. For continuous perfusion, two trocars were used. The fluid was kept at a temperature of 40 C. in a water bath. Specimens of blood were taken before and after the lavage and specimens were taken from the recovered lavage fluid. A normal dog was lavaged on five different occasions at intervals of from two to seven days. Each time the animal recovered and showed no ill effects. The greatest loss occurred in the blood sugar but was not sufficient to cause concern. However, the decrease in the alkali reserve was more significant in that this factor is rather markedly depressed in severe uremia. A second dog was lavaged on three different occasions and the changes in the blood calcium, magnesium, phosphorus, sodium and potassium were studied. There was no appreciable loss in the charted blood constituents, and the dog recovered without incident. The loss in the alkali reserve was not marked. Five uremic dogs were then studied by the same technic. The decrease in the nonprotein nitrogen of the blood ranged from 10 to 59 mg. per hundred cubic centimeters. The greatest reduction occurred in cases in which the nitrogen retention was highest. The lack of clinical improvement in these dogs and their early death may be partly explained by the fact that the solution was not buffered properly and had a p_H of 4.2

and that all dogs showed a marked acidosis at time of death. It was also noted that normal dogs anesthetized with morphine and pentobarbital sodium showed a rapid recovery after lavage. The inability of uremic dogs to rid themselves of these anesthetic agents may have been a factor in their death. That nonprotein nitrogen could be eliminated in fairly large amounts through the peritoneum was demonstrated sufficiently to justify trying the method on three patients. The authors do not offer peritoneal lavage as a treatment in hopelessly damaged kidneys, but it is a method worthy of trial in cases in which there is some hope of return of renal function. The treatment of uremia by this method is the treatment of a secondary damaging factor. Every effort should be made to combat the marked fall in the carbon dioxide combining power of the blood, which is a rather constant and dangerous result of uremia.

Possible Substitute for Ketogenic Diet.—Narat's observations on dogs showed that fat emulsion introduced intravenously is well tolerated and apparently utilized for metabolic purposes. The harmlessness of such injections has been proved by clinical observations of experimental animals and also by microscopic examinations of sections of brains, lungs and other organs in which fat embolism is likely to occur. These studies were supplemented by ultramicroscopic observations of the size of fat particles and determination of the rate of their disappearance from the blood stream. The emulsion contains 7 per cent of total lipids composed of 3.5 per cent lecithin and 3.5 per cent pure olive oil. The product is stable and the fat particles do not coalesce. It is suggested that the product could be used as a substitute for a ketogenic diet or a supplement to it. Surprisingly good results were obtained in three cases of pyelitis. Further studies are necessary to establish the value and limitations of the method.

Michigan State Medical Society Journal, Lansing

37: 1-104 (Jan.) 1938

Maternal Care in Michigan: Progress Note. A. M. Campbell, Grand Rapids.—p. 17.
Obstetric Forceps and Their Use. N. F. Miller, Ann Arbor.—p. 22.
Modern Surgery of Biliary Tract. C. D. Brooks, Detroit.—p. 25.
Acute Hematogenous Metaphysitis. C. H. Snyder, Grand Rapids.—p. 30.
Tuberculosis and Pregnancy. R. S. Siddall, Detroit.—p. 34.
Lutein Cysts Associated with Chorioma: Case Reports. H. M. Nelson and C. F. Shelton, Detroit.—p. 39.
Cancer In and About the Mouth. H. C. Saltzstein and M. Z. Feldstein, Detroit.—p. 43.
Occupational Skin Disease. A. E. Schiller, Detroit.—p. 50.
Neurofibromatosis: Von Recklinghausen's Disease. N. E. Aronstam, Detroit.—p. 55.
Animal Experimentation. W. T. Dempster, Ann Arbor.—p. 57.

New England Journal of Medicine, Boston

218: 53-96 (Jan. 13) 1938

Physical Modalities in Treatment of Discrete Superficial Skin Lesions. F. P. McCarthy, Boston.—p. 53.
Treatment of Gonorrhea in Women by Means of Systemic and Additional Pelvic Heating. W. Bierman and E. A. Horowitz, New York.—p. 60.
Traumatic Injury of Condyloid Process of Mandible. K. H. Thoma, Boston.—p. 63.
Immediate Surgery in Acute Cholecystitis. H. M. Clute and J. F. Lembright, Boston.—p. 72.
*Presence of Hemolysins in Acute Hemolytic Anemia: Preliminary Note. W. Dameshek and S. O. Schwartz, Boston.—p. 75.

Presence of Hemolysins in Acute Hemolytic Anemia.—Dameshek and Schwartz have observed three cases of severe hemolytic anemia characterized by acute onset, rapid development of profound anemia, fever, slight to moderate icterus and slight to moderate splenomegaly. In the first two cases the blood picture showed high color index, increased mean corpuscular volume, macrocytosis and nucleated red blood cells. The resistance of the red cells to hypotonic saline solution was normal. In the third case the blood picture corresponded to that commonly seen in congenital hemolytic icterus. Neither large daily doses of concentrated liver extract given parenterally in the first case nor repeated transfusions of blood in all the cases were of any therapeutic value. Splenectomy was, however, followed by prompt and dramatic response, and complete recovery occurred in the three cases. The hemolytic character of the anemia in these cases is demonstrated by the following laboratory criteria: bilirubinemia, absence of bile in the urine and increased urinary urobilinogen, together with the signs of greatly increased regenerative activity on the part of the bone marrow as evidenced by polychromatophilia, reticulocytosis, nucleated red blood cells, the presence of immature polymorphonuclear cells and hyperplasia of the bone marrow on direct examination at biopsy. In performing compatibility tests with the serum of the second patient it was noted that hemolysis of the red cells of prospective donors occurred frequently. Numerous experiments were then performed which demonstrated the presence in the patient's blood serum of a hemolytic factor which was active against cells of all four blood groups, normal control experiments being negative. On the appearance of the third case, tests for hemolysin again demonstrated the presence of a hemolytic factor active against the cells of all blood groups. The serum of the first patient was then investigated and showed a similar, but weak, hemolytic activity.

New Orleans Medical and Surgical Journal

90: 387-444 (Jan.) 1938

Present Status of the Health Examination. W. H. Perkins, New Orleans.—p. 387.
Relation of the Specialist to the General Practitioner. J. B. Gooch, New Orleans.—p. 392.
Epidural Anesthesia in Gynecology and Obstetrics. P. Graffagnino, New Orleans.—p. 396.
*Pellagra Secondary to Lesions of Gastro-Intestinal Tract. W. M. Scott, Shreveport, La.—p. 403.
Nontuberculous Lung Abscess. J. D. Rives, R. C. Major and S. A. Romano, New Orleans.—p. 410.
Plastic Surgery as Allied with Treatment of Cancer. N. Owens, New Orleans.—p. 417.

Pellagra Secondary to Lesions of Gastro-Intestinal Tract.—Scott points out that pellagra secondary to lesions of the gastro-intestinal tract occurs more frequently than is suspected and that the patients who do not respond to a proper diet in a short time, or those who give a history of having been on a normal diet and develop signs and symptoms of pellagra, should be examined for some lesion of the gastro-intestinal tract as a causative factor. Fourteen such cases are reported: seven with typical rectal lesions of venereal lymphogranuloma, two with carcinoma of the stomach, two with definite evidence of malignant manifestations with metastasis and one each of stricture of the esophagus, rectal polyp, recto-vaginal fistula and amebiasis. Any gastro-intestinal lesion that will not allow the proper absorption of the necessary elements and vitamins will eventually cause a deficiency and pellagra.

New York State Journal of Medicine, New York

38: 83-160 (Jan. 15) 1938

Pelvioradiography: Clinical Evaluation. C. E. Heaton, New York.—p. 83.
Supervision in Compensation Cases. J. J. Moorhead, New York.—p. 88.
Benign and Malignant Lesions of the Breast: Diagnosis and Treatment. L. C. Kress, Buffalo.—p. 92.
Polycythemia Vera: Report of Fourteen Cases Teated with Acetylphenylhydrazine. K. R. McAlpin and Katherine Edsall Smith, New York.—p. 101.
Persistent Vomiting in Early Life, with Especial Reference to Obstructions of Gastro-Intestinal Tract. S. W. Clausen, Rochester.—p. 110.
Traumatic Subdural Hematoma. S. W. Gross and T. J. O'Kane, New York.—p. 117.
Bacillus Alcaligenes Infections. L. H. Goldberg, Nyack.—p. 122.

Psychiatric Quarterly, Utica, N. Y.

12: 1-212 (Jan.) 1938

Some Observations in Treatment of Dementia Praecox with Hypoglycemia. M. Schatner and F. J. O'Neill, Central Islip, N. Y.—p. 5.
Study of Impairment of "Abstract Behavior" in Schizophrenic Patients. Marjorie Bolles and K. Goldstein, New York.—p. 42.
*Clinical Effects of Benzedrine Sulfate in Mental Patients with Retarded Activity. L. F. Woolley, Towson, Md.—p. 66.
Serology in General Paresis. J. R. Blalock and L. E. Hinsie, New York.—p. 84.
Intraventricular Meningiomas (Choroidal Fibroblastomas). A. Ferraro and J. Siris, New York.—p. 117.
Role of Physical Therapy in Treatment of Nervous and Mental Diseases. R. Kovacs, New York.—p. 123.
Psychiatric Aspect of Head Injuries. I. N. Wolfson, Poughkeepsie, N. Y.—p. 137.
Technical Approaches Used in Study and Treatment of Emotional Problems in Children. J. Louise Despert, New York.—p. 176.

Effects of Benzedrine Sulfate on Mental Patients.—Woolley used benzedrine sulfate in the treatment of forty-four cases diagnosed as schizophrenic, twenty-one as manic depressive and five as psychoneurotic. The patients were observed

V 1
193

for from six to nineteen months. About 25 per cent of the retarded patients in all diagnostic groups may be improved by the administration of the drug, about 25 per cent of the retarded patients in all diagnostic groups are made much worse by its exhibition and approximately 50 per cent do not appear to be affected. In general those patients who showed evidences of agitation or fear and anxiety were either not materially affected or were made worse. Altogether similar patients, however, were in several instances improved by proper benzedrine dosage. Since patients who reacted favorably to the medication showed practically immediate improvement on the administration of doses of 10 mg. over a period of from one to three days, lack of response to small doses or unfavorable response to small doses should be taken as an indication for discontinuing the medication. Benzedrine sulfate properly administered in states of extreme depression and retardation may on occasion determine the difference between prolonged serious illness and fairly prompt recovery. A number of retarded patients, regardless of diagnostic grouping, can be materially benefited in their feelings of well being and in their initiative. On the other hand, the drug is not without its attendant dangers, and promiscuous and uncontrolled use is to be seriously condemned even with small doses.

Public Health Reports, Washington, D. C.

53: 37-68 (Jan. 14) 1938

Studies in Chemotherapy: VII. Some New Sulfur Compounds Active Against Bacterial Infections. H. Bauer and S. M. Rosenthal.—p. 40.
Recent Developments in Our Knowledge of Plague Transmission. C. R. Eskey.—p. 49.

53: 69-112 (Jan. 21) 1938

Blacktongue-Preventive Value of Whole Whey, Delactosed Whey and American Cheese. W. H. Sebrell, R. H. Onstott and D. J. Hunt. —p. 72.
Riboflavin Deficiency in Dogs. W. H. Sebrell and R. H. Onstott.—p. 83.
Toxicology of Selenium: V. Toxic and Vesicant Properties of Selenium Oxychloride. H. C. Dudley.—p. 94.

South Carolina Medical Assn. Journal, Greenville

34: 1-24 (Jan.) 1938

Skin Problems Encountered in General Practice. A. B. Cannon, New York.—p. 1.

Southern Surgeon, Atlanta, Ga.

7: 1-96 (Feb.) 1938

Surgical Treatment of Diverticulitis. F. W. Rankin and A. E. Grimes, Lexington, Ky.—p. 1.
New Skull Traction Appliance. J. D. Blackburn, Thomaston, Ga.—p. 16.
Central Fractures of Neck of Femur. J. S. Speed, Memphis, Tenn.—p. 19.
Congenital Abnormalities of the Female Genitalia. O. Moore, Charlotte, N. C.—p. 40.
Clinical Application of Aschheim-Zondek and Friedman Test. M. L. Stadiem, New Orleans.—p. 44.
Injuries to Bones of the Elbow. A. H. Weiland, Coral Gables, Fla.—p. 54.
Electrosurgery. F. H. Krusen and E. C. Elkins, Rochester, Minn.—p. 61.
Use of Prepuce to Epithelize Tract in Treatment of Imperforate Anus. T. C. Davison, Atlanta, Ga.—p. 68.

Tennessee State Medical Assn. Journal, Nashville

31: 1-40 (Jan.) 1938

Some Medical References in Shakespeare. W. H. Witt, Nashville.—p. 1.
*Chronic Middle Ear and Mastoid Infection. M. M. Cullom, Nashville. —p. 11.
Increasing Responsibility of the Physician to the Infant and Small Child. F. T. Mitchell, Memphis.—p. 18.

Chronic Middle Ear and Mastoid Infection.—Cullom arrives at the following conclusions on the problem of chronic suppuration of the middle ear and mastoid after sixteen years of investigation: 1. At least 85 per cent of purulent infection of the middle ear and mastoid are the result of a purulent sinusitis, nearly always on the same side as the infected ear and mastoid. 2. Of those having scarlet fever, 91 per cent have a coincident infection in the sinuses. It is presumed from clinical symptoms that about the same percentage have a coincident sinusitis in epidemic influenza. 3. If 91 per cent of patients ill with scarlet fever and influenza, together with those having sinusitis in the other exanthematous diseases, have infection in the sinuses, at one time or another practically the entire population suffers from sinus disease. 4. A large proportion of those so infected are left with a chronic sinus infection that tends to last throughout life unless diagnosed and treated. 5. These chronic residual infections constitute a menace to the life, health and hearing of those so infected and make the victim a carrier infecting others by contact and starting epidemics. 6. What is diagnosed as an acute sinus infection is often an acute exacerbation of a chronic sinus infection. 7. When the relationship is established between a chronic middle ear suppuration and a purulent sinusitis, the first step in the treatment of the ear is the elimination of the sinus infection.

Texas State Journal of Medicine, Fort Worth

33: 605-670 (Jan.) 1938

Surgical Treatment of Head Injuries, with Especial Reference to Remote Sequels. W. L. Crosthwait, Waco.—p. 610.
Present Status of Surgery of Thyroid Gland. G. A. Stevens, Hollywood, Calif.—p. 613.
Hysterectomy: Report of End Results. C. H. Harris, Fort Worth.—p. 618.
Cesarean Section: Analysis of 113 Cases. T. F. Bunkley, Temple.—p. 623.
Extraperitoneal Cesarean Section: Report of Cases. C. Hiett, Fort Worth.—p. 626.
Ovarian Cystadenoma Masked by Abdominal Trauma in Eight Year Old Child. H. W. Newman, Austin.—p. 631.
Fractures of Lower Extremity. J. Becton, Greenville.—p. 633.
The Management of Psychiatric Patients in a General Hospital. T. H. Harris and H. Ford, Galveston.—p. 636.
Roentgen Therapy of Breast Cancer. W. G. McDeed, C. P. Harris and E. M. Parker, Houston.—p. 641.
Chronic Actinic Dermatitis: Occupational Hazard of the Southwest. L. M. Smith, El Paso.—p. 644.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

46: 1-60 (Jan.) 1938

Cesarean Section Material of R. K. Smith. T. H. Kelly, San Francisco. —p. 1.
Analysis of 507 Consecutive Cases of Cesarean Section. E. M. Lazard, Los Angeles.—p. 6.
Discussion of Indications for Cesarean Section. P. H. Arnot, San Francisco.—p. 21.
Death After Cesarean. W. B. Thompson and E. J. Krahulik, Los Angeles.—p. 31.

Yale Journal of Biology and Medicine, New Haven

10: 209-308 (Jan.) 1938

The History of Modern Physics in Its Bearing on Biology and Medicine. F. S. C. Northrop, New Haven, Conn.—p. 209.
Whooping Cough: Observations on Experimental Infection in Mice and in Ferrets. C. S. Culotta, New Haven, Conn.; F. L. Marting, Boston, and A. A. Liebow, New Haven, Conn.—p. 233.
Glass Electrodes and Apparatus for Direct Recording of Hydrogen Ion Concentration in Vivo. L. F. Nims, New Haven, Conn.—p. 241.
Bacterial Flora of the Human Vagina. L. Weinstein, New Haven, Conn. —p. 247.
Importance of Correlating Specific Gravity of Urine with Intensity of Color Change in Histidine Pregnancy Test. C. W. Neuhardt, Valhalla, N. Y.—p. 261.
Steady-State Electrical Properties of Human Organism During Sleep. H. S. Burr and Dorothy S. Barton, New Haven, Conn.—p. 271.
*Sulfanilamide in Ophthalmia Neonatorum. T. Willis, New Haven, Conn. —p. 275.
Effect of Replantation, Lens Removal and Optic Nerve Section of Eye of Salamander (Triturus Viridescens). R. R. Chace, Providence, R. I. —p. 281.
Relation of Psychiatry to Public Health. I. V. Hiscock, New Haven, Conn.—p. 289.

Sulfanilamide in Ophthalmia Neonatorum.—Willis cites four cases of gonococcic ophthalmia neonatorum treated with sulfanilamide, in addition to the details of the case referred to by Hageman. Besides the drug, these infants have received auxiliary treatment locally of saline or boric acid irrigations as often as needed to keep the eye free from pus, and cold compresses for any local swelling. The use of sulfanilamide gave a more rapid improvement and cure in these cases of gonorrheal ophthalmia neonatorum than has ever been seen in the clinic with other treatment. A definite routine of treatment has not been evolved. However, it is felt that a large initial dose should be given to attain an immediate high concentration of the drug. It seems necessary to reach a level of around 7 mg. per hundred cubic centimeters (free) for active results. Between 0.2 and 0.25 Gm. of sulfanilamide per kilogram of body weight daily in regularly spaced doses usually produces the requisite concentrations. The hemoglobin should be followed closely and transfusion given as indicated. Other complications also should be watched for.

110
938

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

11: 1-64 (Jan.) 1938

X-Rays in 1896. C. T. Holland.—p. 1.
*Osteitis Tuberculosa Multiplex Cystoides and Sarcoid Lesions. A. E. Connolly.—p. 25.
Our Heritage. R. E. Roberts.—p. 38.
Relative Biologic Effects Produced by Equal Radiation Doses from Radium and from Radon. W. H. Love.—p. 46.

Multiple Cystic Tuberculous Osteitis and Sarcoid Lesions.—Tuberculous osteitis, in which the predominant feature is marked cystic degeneration of the bone, is of slow evolution and shows a marked tendency to recovery. Connolly presents two cases. One was in an infant with widespread bony involvement and collateral intrathoracic tuberculous disease. Biopsy confirmed the clinical diagnosis. In the other case the cystlike changes were located in five dorsal vertebral bodies, which were in contact with a fusiform pervertebral abscess arising from the primary disease in the sixth and seventh thoracic vertebrae. Owing to the probable tuberculous causation of sarcoid disease, also a case of benign lymphogranulomatosis is cited.

British Medical Journal, London

1: 1-54 (Jan. 1) 1938

History of Prevention of Puerperal Fever. M. H. Phillips.—p. 1.
*Lymphoid Tissue of Alimentary Canal. H. G. Thompson.—p. 7.
Modern Treatment of Diabetes Mellitus and Use of Zinc Protamine Insulin. F. G. Lescher.—p. 11.
Persistent Overmolding of Skull Bones Causing Fits in an Infant. G. C. Gordon.—p. 14.
Chronic Disseminated Tuberculosis Illustrated by Case of Corticopleural Disease. F. A. H. Simmonds and W. Pagel.—p. 15.
Fracture of Neck of Femur: Another Method of Inserting the Smith-Petersen Pin. H. B. Roderick.—p. 16.

1: 55-104 (Jan. 8) 1938

Angina of Effort: Clinical Study. G. Bourne and R. B. Scott.—p. 55.
Shortage of Calcium in the "Poorer Class" Diet. Katharine H. Coward, Elsie W. Kassner and Letitia W. Waller.—p. 59.
Sonne Dysentery. R. Miller.—p. 64.
Absence of Antigonadotropic Substances in Blood Serum of Man Injected with Gonadotropic Extracts. A. W. Spence, E. F. Scowen and I. W. Rowlands.—p. 66.
Water Requirements of Surgical Patients. D. L. C. Bingham.—p. 67.

Lymphoid Tissue of Alimentary Canal.—Thompson directs attention to the follicular collections of lymphoid tissue to be found along the alimentary tract (1) at the back of the mouth and nose, where there is a ring of lymphoid tissue consisting of the lingual, palatine and pharyngeal tonsils, (2) in the lower part of the small intestine, as Peyer's patches, (3) in the cecum, as the vermiform appendix, and (4) in the large intestine, as solitary follicles. There is a constant and steady discharge of lymphocytes into the alimentary canal and into the subserous lymphatics and so to the thoracic duct. To determine whether a definite migration of lymphocytes into the lumen of the alimentary canal could be confirmed, rabbits were operated on, the vermiform appendix was separated from the apex of the cecum, which was closed with a purse-string suture, and the open base of the appendix was brought to the surface so that its secretion, if any, might be examined. The ferment amylase present in the secretion of the appendix contained great numbers of lymphocytes, a few large macrophages and some eosinophils. Thus there appears to be a regular flow of cells from the lymphoid tissue into the lumen of the alimentary canal. There was no evidence that the lymphocytes were acting as phagocytes, although numerous bacteria were present. To discover what the reaction of the lymphoid tissue (rabbit) was to pathogenic bacteria the results are suggestive that bacteriolysis takes place either in the lumen of the intestine or in the lymphoid tissue and that bacteria may pass rapidly through the lymph follicles: they may be phagocytosed by the macrophages or, if the infection is a heavy one, may pass on into the subserous lymphatics and thus into the general circulation, giving rise to a generalized infection. In the rabbit the lymphoid tissue of the alimentary canal is normally associated with the presence of gram-positive bacteria, and the author's next effort was to try to find where these bacteria came from and whether there were any conditions which affected the amount of lymphoid tissue or the number of organisms present. Accordingly rabbits were put on a diet deficient in vitamin A. It was obvious that the numbers of organisms in the lymphoid tissue were markedly increased. They appeared to be massed in colonies as if they were multiplying locally. Especially was this the case in the lymphoid tissue of the vermiform appendix. When the animals had been deprived of vitamin A their lymphoid follicles showed signs of atrophy, and in the later stages, when signs of xerophthalmia began to develop, the lymphoid follicles were represented by only a thin layer of leukocytes. This was so marked that it was decided to see whether the readministration of vitamin A would cause a regeneration of the lymphoid follicles. After the addition of carotene in oil for one week the lymphoid tissue was examined and it was found that the deeper follicles showed the characteristics of active regeneration, with both superficial and deep follicles present. This work requires confirmation, but it is suggestive as a reason for the decline in the protective mechanism of the organism against infection and also for the loss of immunity against bacterial infection in vitamin A deficiency.

Irish Journal of Medical Science, Dublin

No. **144:** 703-758 (Dec.) 1937

Physiology in Medical Education and Practice. W. J. E. Jessop.—p. 703.
Treatment of Peripheral Arterial Occlusion. P. T. O'Farrell.—p. 719.
Evolution of Tuberculosis in Man. W. Pagel.—p. 735.
Treatment of Mental After-Effects of Head Injury. F. Pilkington.—p. 742.

Journal of Laryngology and Otology, London

53: 1-96 (Jan.) 1938

*Surgical Treatment of Chronic Cicatricial Stenosis of Larynx (Semon Lecture 1937). E. Schmiegelow.—p. 1.
Origin of Wever-Bray Response and Electrotherapy of Ear. E. Kupfer.—p. 16.

Treatment of Cicatricial Stenosis of Larynx.—Schmiegelow believes that every patient with chronic stenosis due to cicatrization of the soft parts, syphilitic perichondritis, ulceration, postoperative lesions, diaphragmatic formation, synechiae and similar pathologic processes can be cured by external surgical intervention; that is, by correct treatment one will be able to obtain so large a passage through the larynx and the trachea that the patient can do without a tracheal cannula and breathe naturally through the mouth. The operative treatment of chronic laryngeal stenosis is to be compared with a cosmetic operation. The chief advantage of the method is that an india-rubber drain is firmly fixed in the stenosis in such a way that the dilation can continue uninterrupted for weeks and months without being changed and without any inconvenience to the patient. Before attacking the stenosis itself, the tracheal cannula has to be removed as far away from the larynx as possible by means of an inferior tracheotomy. A week later the stenosis itself is exposed freely by splitting it from the outside by means of a laryngotracheal fissure. If diaphragmatic strictures are present they are removed by means of scissors, knives and punch forceps so that the lumen of the stenosed part of the larynx is made as nearly normal as possible. Then an india-rubber drain, about 5 cm. long, is introduced. It is best to use a drain which is slightly wider than the lumen, so that it causes a certain pressure against the walls of the larynx. The india-rubber tube is introduced between the lips of the external wound, which are kept apart by means of retractors, and the drain must be laid so that its ends extend outside the narrowed part of the windpipe. The upper end of the drain lies in the larynx but is not allowed to protrude into the pharynx; it has to be at the level of the upper aditus of the larynx. Fixation of the drain is performed translaryngeally by means of a long, curved, slender perineal needle, which is passed from side to side through the soft parts of the neck, the thyroid cartilage and the drain; then a thin silver wire is drawn back through the throat by means of the needle. The position of the upper end of the drain is controlled either by introducing the exploring finger through the mouth, by indirect laryngoscopy or by direct

V 1
193

(suspension) laryngoscopy in children. The upper end of the drain must be above the vocal cords. The silver wire is cut as closely as possible to the skin while the skin is pressed down with the scissors, so that the skin slips back into its old position and covers the ends of the wire. In children the tracheal cannula has to be left in position during the treatment. In adults it is possible in many cases to remove the tracheal cannula directly after having fixed the drain in its proper place, as the large lumen of the drain will permit of perfectly easy respiration through the mouth. The drain, having been allowed to remain in position for a sufficient time can, together with the wire, after weeks or months be removed from above through the mouth by a laryngeal forceps, introduced by direct or indirect laryngoscopy. This is done in children under general anesthesia, in adults under local anesthesia of the pharynx. Even when a drain has been in position for three months it has always been entirely free from incrustations. The external wound can either be closed with a few stitches or left to itself; it heals in the course of a few days. The author has treated eighteen cases of stenosis of the larynx in this manner and all with good results. The ages of the patients varied from 1 to 56 years. The nature of the stenosis was different in every case.

Journal of Tropical Medicine and Hygiene, London

41: 1-20 (Jan. 1) 1938

Further Report on Pseudomycosis: Indolent Leg Ulcer Based on Study of Fifty-Four Patients. J. F. Hamilton.—p. 1.
Possibility of Treating Schistosomiasis with Unguenta. F. G. Cawston.—p. 8.
Blood Grouping of Aborigines in the Northwest Portion of Central Australia: 1936 Series. J. B. Cleland and T. H. Johnston.—p. 10.

Lancet, London

1: 65-122 (Jan. 8) 1938

Nutrition and Nutritional Diseases. L. G. Parsons.—p. 65.
Sympathetic Denervation of Upper Extremity. E. D. Telford.—p. 70.
*Prevention of Spontaneous Mammary Cancer in Mice by Thyrotropic Hormone of Pituitary Gland. W. Cramer and E. S. Horning.—p. 72.
*Surgical Treatment of Angina Pectoris and Allied Conditions. D. T. Davies, H. E. Mansell and L. O'Shaughnessy, with the cooperation of Dawson.—p. 76.
Transfusion of Blood and Other Fluids in Infancy. G. Ormiston.—p. 82.

110
938

Prevention of Spontaneous Mammary Cancer in Mice.—Cramer and Horning state that the spontaneous development of cancer of the breast in female mice of a special strain having a high incidence of mammary cancer can be prevented by the thyrotropic hormone of the anterior pituitary gland. The changes in the anterior lobe of the pituitary gland, as well as the development of the mammary gland in males, produced by prolonged administration of estrogen, can be kept in check by the simultaneous administration of the thyrotropic hormone. The thyrotropic hormone is therefore in some respects a physiologic antagonist to the estrogenic hormone. The physiologic antagonism between the estrogenic and the thyrotropic hormone has a bearing on therapeutic applications. Thus, the thyrotropic hormone may be useful in the treatment of conditions supposed to be due to an unbalanced action of the estrogenic hormones, such as the precancerous condition of the breast known as cystic disease of the breast (maladie de Reclus, Schimmelbusch's disease) and benign enlargements of the prostate.

Surgical Treatment of Angina Pectoris.—Davies and his associates report initial experiences with the treatment of coronary disease by cardio-omentopexy. The twenty cases are considered in two groups: fifteen cases of angina pectoris and five of other symptoms of cardiac ischemia. There were five deaths in the first group, while there is freedom from angina in eight of the remaining ten. In the second group there was one death and freedom from symptoms in one case. The experimental, pathologic and clinical evidence justifies the application of cardio-omentopexy to a proportion of patients suffering from defective coronary circulation. From consideration of the fourteen surviving patients it is seen that all those who have survived the operation for six months or longer are better, and most of them are free from symptoms. Improvement increases with time. The authors do not claim to prove that surgical operation offers an unfailing cure for angina but only to support the original contention (O'Shaughnessy 1937) that operation is feasible and attended with a low immediate mortality. Now that there is indisputable experimental and pathologic evidence that revascularization of the heart can be induced in man, they feel that its application to a proportion of that enormous group of patients who are suffering from a deficient blood supply to the heart is justified.

Medical Journal of Australia, Sydney

2: 1107-1138 (Dec. 25) 1937

Some Danger Signs in Childhood. S. F. McDonald.—p. 1107.
Dosage System of Cervical Cancer. W. G. Cuscaden and T. H. Oddie.—p. 1112.
Choline Esterase in Myasthenia Gravis. A. B. Corkill and A. H. Ennor.—p. 1121.
Treatment of Respiratory Failure of Poliomyelitis. H. McLorinan and J. Watson.—p. 1123.

Medical Press and Circular, London

196: 1-22 (Jan. 5) 1938

Hints on Certifying Mental Defectives. N. H. M. Burke.—p. 13.
*Sciatica and Its Treatment, with Especial Reference to Epidural Injection. G. Slot.—p. 15.

Treatment of Sciatica by Epidural Injection.—The method used by Slot in the treatment of sciatica has been a combination of epidural injection and manipulation under *n*-methyl-cyclohexenylmethyl malonylurea anesthesia. The advantages claimed by this method are the rapidity of treatment, the simplicity of the technic and the high percentage of cures obtained in comparison to other methods. The two principles of the treatment are: the stretching of the nerve roots by the harmless fluid and manipulation. The needle has first to be introduced in the sacrococcygeal foramen at an angle of about 70 degrees to the skin; to enter the canal, the direction has to be changed to an angle of about 20 degrees to the sagittal plane. One can feel when the needle is in the right place; from 50 to 100 cc. of warm 1 per cent procaine hydrochloride in sterile physiologic solution of sodium chloride is injected slowly, the dose varying with the size of the patient. As the fluid goes in, the resistance is found to increase; the needle is then withdrawn and the puncture is sealed with adhesive plaster. Manipulation is now performed. This consists first in the hyperextension of the lumbar spine; the knee is placed in the hollow of the back and both legs are firmly and gently pulled against it. The patient is then turned round and the knees are straightened, and both legs, one after the other, are forced on the pelvis (the pelvis being fixed by an assistant) so as to stretch the sciatic nerve. On recovery, some analgesic is prescribed for pain and massage is given the next day. In the majority of the author's cases this has been all that has been necessary, but in 20 per cent of them one treatment has not been sufficient and a second injection has been required. In the majority of the series of more than 200 cases the condition has been intractable and has resisted the usual methods of treatment. In cases of osteo-arthritis of the hip the manipulation is reduced to a minimum, although slight manipulation acting with the epidural injection has been most helpful to the patient. This does not apply to the cases in which there has been bony ankylosis. While no cure can be promised, patients have been pleased with the great alleviation of pain that has resulted, and the treatment can, if necessary, be repeated in six months.

South African Medical Journal, Cape Town

11: 859-902 (Dec. 25) 1937

The Workmen's Compensation Act and Its Problems. M. Shapiro.—p. 864.
The Insurers' Point of View. H. Quinton.—p. 866.
The Medical Association's View. J. J. Levin.—p. 868.
The Worker's Point of View. M. Joffe.—p. 870.
Some Social Aspects of the Workmen's Claims. J. Cullen.—p. 872.
Medical Education in Principles of General Practice. K. Bremer.—p. 875.
Some Practical Aspects of Diagnosis and Treatment of Rheumatism. N. Finn.—p. 878.
Urology in General Practice: Points in Technic of Urethral Instrumentation. R. C. Begg.—p. 883.
Reminiscences and Experiences of an Old Physician. V. W. T. Werdmuller.—p. 886.

Annales de Dermatologie et de Syphiligraphie, Paris

8: 921-1055 (Dec.) 1937

Benign Extensive Sclerodermiform Cellulitis. Touraine, Golé and Soulignac.—p. 921.
*Clavicular Sign and Its Diagnostic Value in Hereditary Syphilis. G. C. Higouménakis.—p. 939.

Clavicular Sign in Hereditary Syphilis.—Higouménakis points out that in June 1927 he demonstrated before the medical society of Athens a patient with hereditary syphilis, who had a tumefaction of the internal third of the right clavicle. Subsequently he observed this enlargement of the sternal extremity of the right clavicle in a number of patients in whom hereditary syphilis could be assumed. He gained the impression that this clavicular sign has diagnostic value in hereditary syphilis. Its frequency in persons with hereditary syphilis is much greater than that of the other stigmas. It is never observed in patients with acquired syphilis or in entirely healthy persons. He mentions other investigators who observed this clavicular sign in patients with hereditary syphilis. It is suggested that the enlargement of the clavicle is a hyperostosis, which results from an osteitis that in turn is produced by the spirochetes in the sternal extremity of the clavicle. The author reports the clinical histories of twenty patients with hereditary syphilis in whom the clavicular sign could be observed. He stresses the great value of the sign, which is superior to that of the other stigmas of hereditary syphilis because of its frequency and the ease with which it can be detected.

Gynécologie et Obstétrique, Paris

36: 481-560 (Dec.) 1937

Atypical Growth of Glands of Body of Uterus, Epidermization of Cervical Mucosa, Disturbances in Equilibrium Between Ovary and Anterior Hypophysis After Ovarian Interventions. A. Lipschütz.—p. 481.
*Surgical Treatment of Suppurated Puerperal Mastitis. J. Kreis.—p. 499.
*Value of Radium Therapy in Treatment of Cancer of Vulva. J. Nuytten and R. Garraud.—p. 508.
Unilateral Absence of Adnexa and Amputations by Torsion. J.-G. Regad.—p. 522.
Functional Interrelations of Endocrine Glands Between Themselves and with Ovary in Genesis of Ovular Menstrual Process. R. Araya.—p. 534.

Surgical Treatment of Mastitis.—Kreis has treated suppurating puerperal mastitis by means of radiating and large incisions in more than 100 cases, but often without satisfaction. Recovery was slow and the cicatrization, which is accomplished by granulation and retraction, often leaves much to be desired as regards esthetic results. The author developed a modification of the technic. Frequently suppurating mastitis is represented not by a single abscess but by several juxtaposed abscesses, which do not mature at the same time. To avoid repeated incisions and multiple scars, he makes a circular incision at the border of the pigmented zone of the areola. The para-areolar incision is justified because it always provides access to the abscess cavity. Abscesses which are located above the horizontal line that runs through the nipple and divides the breast into two halves can be drained by a para-areolar incision without any other incision. In abscesses of the lower hemisphere of the breast, the author employs a para-areolar incision corresponding to the localization of the abscess and a counter incision in order to have a declivity to facilitate drainage. The counter incision must always be made into the breast itself and not at the base of its insertion. The incision is made circular and parallel to the periphery of the breast. If the breast is voluminous and pendulous and the counter incision has to be made on the internal or external lateral part, it is necessary to make an incision parallel to the direction of the slope of the breast in the erect posture. The circular incision involves only the skin; a transverse incision of the galactophorous ducts is not necessary. For drainage, perforated rubber tubes are more effective than gauze drains. The wound should be dressed every day and drainage should be discontinued at the earliest opportunity. In general, drainage of a para-areolar incision does not exceed a week and frequently it can be reduced to three days. The author employed this treatment in forty-three cases; not only is the esthetic result better but the cure is more rapid than with the former surgical method.

Radium Therapy for Cancer of Vulva.—After reviewing the literature on the radium therapy of cancer, Nuytten and Garraud describe their personal experiences in seventeen cases. Radium therapy produced excellent results in cancer of the vulva; in 50 per cent of the cases considerable improvements were obtained, even in cases in which the process was quite advanced, and in half of these cases the cure was complete. The inguinal adenopathies constitute the key to the prognosis. Cases of cancer of the vulva in which there exist no adenopathies have good prospects of cure. If adenopathies exist, recurrences are frequent even after complete bilateral inguinal adenocellulectomy or after irradiation. The authors used the following methods: radium puncture, obturators containing radium, radium moulages and teleradium therapy. Radium puncture was used in twelve cases, in six of which it proved successful; in the other cases, although it counteracted the vulvar ulceration, the patients succumbed to adenopathies. The authors think that radium puncture is the technic of choice for the treatment of localized epitheliomas on the labia, the frenulum and the clitoris. It is necessary to guard against excessive doses, which may provoke necrosis in the sensitive tissues of the vulva. The obturators that contain radium are advisable in cancers of the meatus. The application of radium to the surface by means of moulages or by teleradium therapy is reserved for extensive lesions or for adenopathies.

Presse Médicale, Paris

46: 169-184 (Feb. 2) 1938

Fractionated Galactosuric Concentration Tests: Its Results in Alcoholic Cirrhoses of Liver. M. Chiray, G. Albot and J. Dieryck.—p. 169.
Applications of Physiopathology of Lung to Collapsotherapy. E. Morelli.—p. 171.
*Surgical Treatment of Angina Pectoris by Revascularization of Myocardium. M. Bérard.—p. 173.

Revascularization of Myocardium in Angina Pectoris.—Bérard says that, among the technical advances in surgery, revascularization of the myocardium in angina pectoris is one of the most audacious and brilliant. The results obtained by Beck in the United States and by O'Shaughnessy in England seem sufficiently numerous to justify a discussion of the physiologic bases of this method. Before revascularization was developed by Beck in recent years Klose demonstrated in 1922 the possibility of using free grafts of omentum to replace excised portions of the pericardium; moreover, Leriche and Fontaine in 1932 employed a free graft of the pectoralis muscle and in animal experiments demonstrated that ischemic myocardium gradually regains sufficient if not absolutely normal vascularization by way of an anastomotic circulation. He cites Beck's experiments, which demonstrated the importance of a homogeneous vascular distribution in a given territory of the myocardium. It has been observed that in occlusion of both coronary arteries vascularization of the myocardium is still possible. Theoretically this is possible in two ways; namely, by direct ventricular circulation and by the thebesian circulation. The observation of pericardial adhesion in case of complete obliteration of the coronary arteries suggested the role of these adhesions in reestablishing the myocardial circulation. Realizing the vascular character of these adhesions, Beck conceived the idea of revascularization of the myocardium; that is, the preparation of the so-called vascular bed, which can be done in two ways: by a pediculated graft of the pectoral muscle or by an omental graft. The first of these two methods was used by Beck. In reviewing Beck's work, the author says that of eleven interventions six were successful. O'Shaughnessy, who employed omental grafts, had only one fatality in six cases. That omentopexy is superior to myorraphy is shown by O'Shaughnessy's figures.

Giornale di Clinica Medica, Parma

19: 1-106 (Jan. 20) 1938

Vitamin C and Alkali Reserve. A. Capuzzi.—p. 2.
Difficulties in Diagnosis of Endocarditis. G. Donini.—p. 9.
Cholesterol Metabolism in Postencephalitic Parkinsonism. G. Fattovich.—p. 19.
*Relations Between Constitution and Pressure of Cerebrospinal Fluid and Function of Circulatory and Uropoietic Organs in Old Age. G. Zanotto and G. Scaramuzza.—p. 36.

Cerebrospinal Fluid in Old Age.—Zanotto and Scaramuzza made systematic researches on twenty-three patients, from 68 to 85 years of age, who had arteriosclerosis, arteritis or renal sclerosis. They found the arterial blood pressure

V 1
193

increased in old age. It is not related to the pressure of the venous blood and of the cerebrospinal fluid, which are normal and related to each other. The amount of dextrose in the blood and in the cerebrospinal fluid is increased with a normal ratio. The amount of albumin in the cerebrospinal fluid and the cytology of the fluid are normal. The average figures for chlorides in the cerebrospinal fluid are almost normal. The amount of urea in the blood and the cerebrospinal fluid is increased with a ratio near unity. The elimination of urea through the urine is diminished and Ambard's formula is increased in the majority of cases. It is independent of arterial pressure and of the ratio of urea in the blood and in the cerebrospinal fluid. The increased amount of urea in the blood and in the cerebrospinal fluid depends on the diminished elimination of urea through the urine. Alterations of the pressure of the cerebrospinal fluid or of the chemistry of the fluid are due to pathologic conditions which involve the brain or to disorders of the cerebral circulation. They were observed in six patients in the authors' group who were suffering from cerebral thrombosis, senile dementia and softening of the brain.

Minerva Medica, Turin

1: 113-144 (Feb. 3) 1938

Apogimnic Treatment of Tuberculosis and Cancer. E. Centanni.—p. 116.
*Clinical Researches on Variations of Tuberculin Allergy in Diseases of Lymphatic Glands and Their Clinical Value, Especially in Tuberculosis of Lymphatic Glands and Malignant Granuloma. C. Rotta.—p. 118.
Phthisis in Adults and Importance of Tuberculosis in Children. E. Filla.—p. 127.

Allergy in Diseases of Lymphatic Glands.—Rotta followed the behavior of allergy to tuberculin in a group of 700 patients who were suffering from diseases of the lymphatic glands. He determined the intensity of allergy from the intensity of the tuberculin reaction, which was done by means of an intradermal injection of 0.2 cc. of a 1 to 3 per thousand old tuberculin solution. The same dose of a 1 per 500 old tuberculin solution was intradermally injected in anergic patients. The greatest tuberculin reaction consists in the appearance of a necrotic papule at the point of the injection, which shows intense allergy. It appears in almost all cases of tuberculosis of the lymphatic glands, especially if there is caseous degeneration of the glands. It is a reaction proper to tuberculous lymphoma and to tuberculous, tracheobronchial or hilar adenopathies. The reaction is more intense when the lymphatic structures only are involved by tuberculosis than when they, as well as the lung, are tuberculous. Patients who are suffering from malignant granuloma are in a condition of anergy or hypo-anergy, except when the condition coincides with hyperplasia of the reticulo-endothelial tissues, especially of the spleen, or with tuberculosis in evolution. Patients who are suffering from tuberculous hyperplasia of Ziegler's type are in a condition of transient anergy, which changes to allergy as the adenopathies and splenomegaly disappear. In myeloid and lymphatic leukemia, lymphosarcoma and reticuloma there is allergy. In tumors of the mediastinum and the liver and tumoral metastases in the lymphatic glands there is anergy. The author concludes that in adults who are suffering from lymphopathies the presence of an intense old tuberculin reaction shows the tuberculous origin of the lymphatic condition. Anergy shows malignant granuloma, tuberculous hyperplasia and tumoral metastases. The negative results of the tuberculin reaction in children who are suffering from adenopathies indicate that the patients do not have tuberculosis.

Policlinico, Rome

45: 1-52 (Jan. 15) 1938. Surgical Section

Value of Indoxylemia in Diseases of Urinary Tract. C. Beccari and F. Gherardi.—p. 1.
*Influence of Zone of Carotid Gland on Calcemia. G. Gentile.—p. 22.
*Variations of Erythrocytosis After Gastric Resection in Duodenal Ulcer. V. Jura.—p. 31.
Phosphatases of Bones and Plasma in Osteopathies. G. Montemartini.—p. 38.

Influence of Zone of Carotid Gland on Calcemia.—Gentile experimented on dogs in which the adventitia of the common, internal and external carotid artery had been removed and the zone of the carotid gland denervated by touching it with 80 per cent alcohol. The calcium in the blood was determined twice before the operation at intervals of two days and several times afterward at weekly intervals. The author concludes that the denervation of the zone of the carotid artery and of the carotid sinus induces in all cases slight hypocalcemia, which lasts for about one week and is followed by transient slight hypercalcemia. After these changes the amount of calcium in the blood returns to its preoperative value. Hypocalcemia shows the result of the so-called physiologic parathyroidectomy which takes place in men after any simple, surgical intervention on the neck. Hypercalcemia is the result of transient increased function of the parathyroids from vasodilation by the operatory and chemical denervation of the carotid zone. Processes of diffused or circumscribed decalcification of the bones did not show on roentgen examination of the skeletons of the animals in the author's experiments. Because of the results of the operation on calcemia, the condition of the parathyroids was not investigated. The results obtained by the author conflict with those reported in the literature by Collazo and his collaborators, who observed in dogs in which the zone of the carotid gland had been removed intense and persistent hypercalcemia associated with loss of muscular activity, emaciation, falling out of the hair and fatal progressive cachexia. However, they confirm those reported by Tabanelli in experiments on the carotid sinus.

Erythrocytosis After Gastric Resection in Duodenal Ulcer.—Jura discusses the relations between certain segments of the digestive tract and hematopoiesis. He followed the variations of hemoglobin and of erythrocytosis in twenty patients after gastric resection. He found that erythrocytosis and the amount of hemoglobin, which are diminished in patients who are suffering from duodenal ulcers, are still more diminished six months and one year after gastric resection. Erythrocytosis and hemoglobin greatly diminish during the first two weeks following resection, after which they slowly increase to almost normal; the morphology of the erythrocytes and leukocytes is normal and the general condition of the patients improves. The author believes that the diminution of erythrocytosis and hemoglobin that takes place shortly after gastric resection is due to lack of the Castle principle in the gastric secretion and diminished capacity of the remaining segments of the digestive tract for absorption of iron. The slow but progressive increase of erythrocytosis and hemoglobin is due to vicarious hematopoietic function of the digestive tract, especially the duodenum and the small intestine. The improvement of the condition of the blood after gastric resection is spontaneous. The author's patients did not receive any treatment for the control of anemia. According to the author, the value of gastric resection in the treatment of gastric cancer or peptic ulcer is obvious. He advises certain medical treatments which may result in a better absorption of iron by the body, soon after gastric resection, to stimulate the antianemic reaction of the remaining segments of the digestive tract.

Rivista di Patologia e Clin. d. Tubercolosi, Bologna

11: 897-988 (Dec. 31) 1937

Chronic Nodular Pulmonary Tuberculosis. M. Anzalone.—p. 897.
Lipases of Blood of Animals Treated with Parenteral Injections of Beeswax: Experiments. G. Tosi.—p. 922.
*Diiodotyrosin (3.5 Diiodo-4-Oxyphenylalanine) in Treatment of Pulmonary Tuberculosis. G. L'Eltore and G. Scoz.—p. 933.
*Hypoglycemia and Symptoms of Intolerance to Intravenous Injections of Calcium. M. Mazzetti.—p. 940.
Intrapleural Injections of Sterile Olive Oil, Unverricht's Technic, at Beginning of Pneumothorax in Prevention of Parapneumothorax Pleurisy. F. Ravazzoni and C. Croce.—p. 951.

Treatment of Pulmonary Tuberculosis.—L'Eltore and Scoz say that, if a disease, infection or nutritional disturbance coexists with pulmonary tuberculosis and is controlled, the evolution of tuberculosis greatly improves, especially if the diseases are closely related. The authors administered 3.5 diiodo-4-oxyphenylalanine to six patients having pulmonary tuberculosis with slight hyperthyroidism. All patients in the group were under weight, had lability of the sympathetic nervous system and a cardiac rhythm more frequent than normal and showed signs of hyperthyroidism. The dose varied from 0.05 to 0.15 Gm. and was administered at intervals varying from three to five weeks, according to the action of the substance on the cardiac rhythm, until from nine to twenty-three injections had been given. The clinical and roentgen examinations of the

patients showed no aggravation of the tuberculosis. All the patients gained in weight. Their general physical and psychic condition and appetite improved. However, the treatment is symptomatic: the patients lose weight some time after its discontinuation and regain weight as soon as the treatment is given again. According to the authors, the preparation specifically antagonizes hyperthyroidism. Its effects may be due to the iodine that is contained in the substance. The treatment is well tolerated and harmless if given with caution as to the dose and intervals.

Hypoglycemia and Intolerance from Calcium.—Mazzetti studied the effects of intravenous injections of calcium on glycemia in a group of fifty-one patients who were suffering from pulmonary tuberculosis. The group included three tuberculous patients with diabetes. The author concludes that the intravenous injections of 10 cc. of 10 per cent solutions of different salts of calcium diminishes glycemia in the majority of cases. The diminution varies from 0.15 to 0.3 mg. of sugar per thousand cubic centimeters of blood. Lower values of hypoglycemia due to injections of calcium are exceedingly rare. In a few cases there is a moderate increase of glycemia, which varies from 0.09 to 0.34 mg. per thousand cubic centimeters of blood. The diminution of glycemia takes place within fifteen or thirty minutes after the injection of calcium solution and rarely after forty-five or sixty minutes. Three patients in the author's group who had diabetes showed low glycemic values and did not show symptoms of hypoglycemia and intolerance to calcium. Another group of thirty-six patients reacted with the symptoms of intolerance to an intravenous injection of 5 cc. of a 10 per cent solution of calcium gluconate. The author does not believe that the intravenous injection of calcium induces the syndrome of intolerance to calcium. He believes that the so-called late symptoms of intolerance to calcium are caused by faulty preparation of the solution to be used for the injections. The reason why the solution induces the development of symptoms of intolerance is not known.

Klinische Wochenschrift, Berlin

16: 1809-1824 (Dec. 25) 1937. Partial Index

Pathogenesis of Rhinogenic Meningitis. L. Burkhardt.—p. 1809.
*Xanthoprotein Content of Blood in Patients with Rheumatism. F. Knüchel.—p. 1810.
Further Investigations for Demonstration of Biologic Actions of Irradiated Electrolyte Solutions by Means of Schultz-Dale's Method. S. Wolfram and O. Ried.—p. 1811.
*Late Electrocardiographic Diagnosis of Myocardial Infarct by Means of Thoracic Lead. F. Kisch.—p. 1812.
Takata-Ara Reaction (One Glass Method) for Neurosyphilis in Ambulatory Practice. M. Kraus.—p. 1815.
Demonstration of Bile Acids by Determination of Surface Tension. A. Müller.—p. 1817.

Xanthoprotein in Blood in Rheumatic Patients.—Knüchel points out that, although the importance of focal infection for the genesis of rheumatic disorders is recognized, it has not been explained why the rheumatic disorder settles in some cases chiefly in the joints of the extremities and in others in the vertebral joints. The author is convinced that endogenic factors have a part in this localization. Studies on ochronosis revealed that homogentisic acid and many other phenol bodies have a high degree of chondro-affinity. Thus it seems justified to search for phenol-like substances in patients with rheumatism. Since large quantities of blood are required for the detection of phenol bodies, the author used a group reaction for the phenol bodies; namely, the xanthoproteic reaction. Tests on rheumatic patients and on healthy persons revealed no essential differences in the xanthoprotein values of the two groups. However, in a certain type of rheumatic disease, namely, Bechterew's disease (spondylitis deformans), the xanthoprotein values are from one fourth to one third higher. This increase is demonstrable before characteristic symptoms develop. This new method for an early diagnosis of spondylitis deformans is of great value in that treatment is of little avail during the later stages of the disease. An increase in xanthoprotein values is not always an indication of spondylitis deformans; it may result also from renal insufficiency and after prolonged medication with large doses of aminopyrine; but under these conditions the values are usually so high above the normal that an error can be avoided. The demonstration of an increase in the xanthoprotein content of the blood is not only of value for the diagnosis of spondylitis deformans but also throws some light on the pathogenesis of the disorder. He suggests that an increase in the phenol bodies, by virtue of their chondro-affinity, may cause a reduction in the resistance of the synchondrosic apparatus and, on the basis of reduced resistance, a focal infection may elicit the characteristic changes of spondylitis deformans. The cause of the increase in the xanthoprotein content of the blood has not been explained. The favorable therapeutic effects that have been obtained with dietetic measures, particularly with protein deficient diets, could be in accord with either an intestinal or a renal origin.

Electrocardiographic Diagnosis of Myocardial Infarct.—Kisch cites investigators who demonstrated the value of electrocardiography in the diagnosis of cardiac infarct but shows that the customary leads from the extremities may fail to disclose the presence of a cardiac infarct. The introduction into electrocardiography of the thoracic leads, in addition to the customary leads from the extremities, has reduced the possibility of a cardiac infarct escaping detection in the electrocardiogram. There is no agreement as to which type of thoracic lead should be employed and the multiplicity of methods results in confusion. To avoid this confusion, he recommends indicating what type of thoracic lead has been employed. Scherf suggests that the most suitable thoracic lead is that "from the left leg to the region of absolute cardiac dulness" (electrode of the left arm attached to the left leg and the electrode of the left leg applied to the area of absolute cardiac dulness). This he designates as lead 4 and, to identify it more exactly, he adds in parentheses the initial letters for the leg and the heart. He concludes that, whenever there is the slightest suggestion of myocardial impairment, the thoracic lead should be taken in addition to the customary leads from the extremities. He cites case histories which indicate that, if this thoracic lead is taken, the electrocardiogram will reveal even cardiac infarcts that developed years ago. In the suggested cardiac lead an old myocardial infarct of the anterior wall is indicated by a barely suggested initial R of the beginning deflection or by its complete absence and by a high onset and arc-like downward course of the terminal deflection, which occasionally ends in a negative wave.

Münchener medizinische Wochenschrift, Munich

84: 2009-2048 (Dec. 17) 1937. Partial Index

*Influenza and Tuberculosis. J. E. Kayser-Petersen.—p. 2009.
Practical Results of Functional Test of Lung in Treatment of Pulmonary Tuberculosis. W. Verwerk.—p. 2011.
Multiple Cartilaginous Exostoses and Their Hereditary Transmission. B. H. Wiebeck.—p. 2013.
Reform of Social Insurance in Germany: New Organization of Sick Insurance. K. Haedenkamp.—p. 2016.
Experiences with Uliron in Staphylococcic Infections. G. Killmer and A. Nehrkorn.—p. 2021.
Treatment of Fulminating Purpura During Infectious Diseases, Particularly During Scarlet Fever. E. Puschel.—p. 2030.
*Infections with Bacillus Funduliformis, with Especial Consideration of Pleural Disorders. W. Brunner.—p. 2032.

Influenza and Tuberculosis.—Kayser-Petersen shows that the influenza which complicates an active or inactive tuberculosis generally takes a favorable course; to be sure, the course may be the more unfavorable, the more severe is the influenza and the more serious and extensive is the tuberculous process. Discussing the action of the influenza on the tuberculosis, he says that in most cases the tuberculosis is not unfavorably affected; however, here too exceptions are possible; that is, a turn for the worse may take place if either one of the processes is especially serious. In most cases in which it was believed that tuberculosis developed following influenza the disorder in question was not influenza at all but rather an influenza-like acute onset or exacerbation of a tuberculous process. For this reason it is less important from the practical point of view to protect tuberculous patients against influenza than to think of tuberculosis and search for it by examination of the sputum and by roentgenoscopy, in all cases of so-called influenza.

Infections with Bacillus Funduliformis.—Brunner surveys the clinical significance of Bacillus funduliformis, which belongs to the large group of anaerobic, gram-negative bacilli which do not form spores and which normally occur in the cavities of the human body. It has been found that Bacillus funduliformis may enter the blood stream without accompanying bacteria and may cause severe general infections with suppurat-

V 1
193

ing metastases in the lungs, liver and joints. The portal of entry in adults is generally an angina and in children an inflammation of the middle ear. In contradistinction to infections that are caused by the ordinary pyogenic organisms, those caused by Bacillus funduliformis usually do not involve the endocardium, spleen and kidneys. Another characteristic of infection with Bacillus funduliformis is that in the beginning a massive necrosis of the parenchyma of the organ develops and that the invasion by leukocytes follows secondarily. The author describes three cases of his own observation in which Bacillus funduliformis had caused pleural empyemas. In contradistinction to the cases reported in the literature, these were not accompanied by a sepsis. Such cases have from the beginning a favorable prognosis because they have a tendency to encapsulation and because the primary disease, which is responsible for these forms of empyema, usually remains in the background. Under these conditions the infections with Bacillus funduliformis are not readily differentiable from common pyogenic infections. Such cases demonstrate again the great importance of a careful bacteriologic examination for the estimations of surgical infections. It reveals that even strictly anaerobic, nontelluric bacilli are disseminated by the blood stream and are the causal agent of metastases more frequently than was assumed formerly.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

101: 585-782 (Nov. 15) 1937. Partial Index

Studies on Coagulation of Blood, with Especial Consideration of Hemophilia. W. Grunke.—p. 585.
*Investigations on Division of Blood Sugar Between Blood Corpuscles and Blood Plasma Under Normal and Pathologic Conditions. Also Contribution to Spontaneous Hemoglycolysis. P. Larizza.—p. 597.
Chemical Composition of Leukocytes in Human Blood. P. Larizza.—p. 615.
*Anemia in Rats After Administration of Excessive Amounts of Vitamin A. W. Papke.—p. 648.
Action of Water Tolerance Test on Elimination of Creatinine and Solid Constituents (Dry Residue) of Wine. F. v. Krüger.—p. 666.
*Etiology of Idiopathic Hydronephroses. W. Tomoff.—p. 701.
*T Wave in Electrocardiogram of Children. H. Remé.—p. 729.

Blood Sugar in Blood Corpuscles and in Blood Plasma.—Larizza shows that under normal conditions the blood corpuscles contain less blood sugar than does the blood plasma but that the distribution of the blood sugar between these two elements of the blood varies greatly. It was found that the average distribution coefficient is 0.83. The blood of diabetic persons shows no essential deviation in this respect. To be sure, the quantity of sugar in the erythrocytes is greater in diabetic than in normal persons, but the percental distribution between the erythrocytes and the plasma is about like the average. Of the various pathologic conditions, leukemias show the severest changes, for in these the concentration is about the same in the corpuscles and in the plasma, or the corpuscles may even have a higher content than the plasma; that is, the coefficient of distribution may be reversed. The blood corpuscles of patients with heart disease who have cyanosis show a tendency to increase their sugar content, whereas in patients with uremia and in many of those with cancer the reverse tendency is demonstrable. In sterile, normal blood that is kept at room temperature, the sugar content gradually decreases. In the course of ninety-six hours it gradually loses its reducing substances, and the portion of reducing substances which is not destroyed consists of substances other than sugars. In the plasma that remains in contact with the blood corpuscles, the destruction of the sugar is rather rapid; this is probably the result of a closer contact with the leukocytes. Serum that is in contact with the blood clot likewise has glycolytic power, but in this respect its capacity is inferior to that of the whole blood or of the plasma. Plasma and serum that are free from blood corpuscles are inactive in this respect and may even show an increase in reducing substances. Blood from diabetic patients behaves in general like normal blood. To be sure, during the same period much greater quantities of sugar are decomposed in diabetic than in normal blood. This indicates an increased glycolytic power. Blood from patients with leukemia has a greatly increased glycolytic capacity.

Anemia After Excessive Amounts of Vitamin A.—Papke directs attention to the fact that other investigators had observed that the administration of large doses of vitamin A results in a progressive anemia. He decided to verify this. The experimental animals were growing rats. The vitamin A was given in the form of an oily preparation which, in addition to vitamin A (40,000 biologic rat units per cubic centimeter), contained also vitamin D (3,000 rat units per cubic centimeter). The solvent for the two fat-soluble vitamins was an oil. This oil without the vitamins was given to the controls. The administration of large doses of the vitamin oil solution (0.5 to 2 cc. daily) produced pathologic changes in young rats (from 4 to 6 weeks old) but failed to do so in rats that were 6 months old. The development of a progressive hypochromic anemia with hyperplasia of the marrow could be verified. The behavior of the reticulocytes in the circulating blood indicated an inhibition in their elimination from the bone marrow, and changes in the bone marrow indicated that there was a disorder in the process of maturation. There were no hemosiderin deposits in the spleen. Other disorders that were observed in the rats were diarrhea and spontaneous fractures. Moreover, the leukocytic blood picture showed a deviation from the lymphatic to the myeloid. Necropsy revealed no inflammatory changes in the internal organs. The anemia is probably a result of the toxic action of vitamin A on the bone marrow. A possible influence of the vitamin D is considered.

Etiology of Idiopathic Hydronephroses.—To clarify the etiology of the so-called idiopathic hydronephroses, Tomoff made experiments on dogs. His studies revealed that the disturbance of the ideal functional harmony between the different parts of the urinary passages is the primary cause of hydronephrosis. In his experiments the author induced this disturbance by denervation of the renal pelvis and of the upper part of the ureter, for this denervation disrupted the functional equilibrium. The author thinks that this factor and the changes that, following the paralysis, develop in the wall of the renal pelvis cause a dilatation of the renal pelvis and of the calices and thus lead to hydronephrotic conditions. He says that pyelograms and the macroscopic and microscopic investigations corroborate his assumption. He further investigated the significance of the fibrous capsule for the development of the hydronephroses. His experiments proved that a congenital or acquired weakness of the elastic fibrous capsule is to a certain extent responsible for the development of hydronephrotic conditions, for this capsule is important for the preservation of the equilibrium of the intrarenal pressure.

T Wave in Electrocardiogram of Children.—Remé states that Wilhelm Trendelenburg observed several years ago that in an entirely normal child the T wave was negative in lead 3. He suggested that this was probably due to the fact that the heart was located higher up in the thorax and that thus the center of the attachment of the left arm was not above but below the iso-electric line for the T wave. Remé made further investigations on this problem and found that in children without cardiac defects the T wave in lead 3 may be negative but that as the children grow older it becomes positive. In children in whom T_3 is positive when the arms are in the customary position T_3 can be made negative by pulling the left arm downward. When the left arm is pulled up, the positivity of T_3 becomes stronger than is the case when the arms are in the usual position. This seems to suggest that the T wave in lead 3 may become negative with the ordinary position of the arms when during early childhood the heart is still somewhat higher up in the thorax than is the case later on. The author points out further that changes in the form of the P wave which are observed in case of negativity of T_3 can be explained in the same manner. If the left shoulder is pushed higher and the site of the lead is thus located higher up on the thorax, the P wave assumes the normal outline.

Wiener Archiv für innere Medizin, Vienna

32: 1-46 (Jan. 31) 1938

Vascular Spasms Caused by Digitalis. E. Schill.—p. 1.
*Pulmonary Tuberculosis in Diabetes Mellitus. W. Pilgerstorfer.—p. 7.
*Significance of Demonstration of Intestinal Hemorrhage for Diagnosis of Carcinoma of Caudal Part of Pancreas. O. Riml.—p. 21.
Transition of Hypochromic Resection Anemia Into Pernicious Anemia. K. Buchgraber and H. Fleischhacker.—p. 33.
Interrelations Between Thyroid and Female Sex Organs. J. Adler-Mönnich and R. Tiberi.—p. 41.

Pulmonary Tuberculosis in Diabetes Mellitus.—Pilgerstorfer studied the cases of diabetes mellitus in the first medical clinic of the University of Vienna from 1923 to 1936. Of the 1,208 patients with diabetes mellitus, seventy-one, or

110
938

5.8 per cent, had also pulmonary tuberculosis. Treatment with pneumothorax produced favorable results in patients with early infiltrates; however, the pneumothorax had no noticeable influence in the more advanced cases. Insulin treatment had no decisive influence on the course of the pulmonary tuberculosis in the diabetic patients. Administration of insulin did not prolong the average life span of diabetic patients who received a diet with low carbohydrate content. The author found that the diet with high carbohydrate content is the most valuable therapeutic method for diabetic patients with pulmonary tuberculosis. The protein and fat content of the diet seems to be of no decisive significance for the prognosis. The author reaches the conclusion that the life expectancy of the diabetic patients with pulmonary tuberculosis is much better with a diet of high carbohydrate content than with a diet of low carbohydrate content.

Intestinal Hemorrhages in Carcinoma of Pancreas.—Riml reports three cases in which carcinoma of the caudal portion of the pancreas was demonstrated either by necropsy or by biopsy. All the patients had hemorrhages into the gastrointestinal tract. There were hematemesis, melena and colics in the epigastric region. The author suggests two possible explanations for the gastro-intestinal hemorrhages that accompany carcinoma of the caudal portion of the pancreas: 1. They may be due to diapedesis from congested, varicose veins of the mesenterium, stomach or duodenum. Necropsy in two of the cases revealed that the pressure of the primary tumor or of its metastases against the mesenterial root may readily cause such stasis and diapedesis. This mechanism is especially probable in late hemorrhages; that is, in those developing during the advanced stages of pancreatic carcinoma. 2. The hemorrhages into the intestine may be caused by intrapancreatic hemorrhage with discharge of the blood through the pancreatic duct. To be sure, in the two cases that came up for necropsy such hemorrhages could not be proved. The author suggests, however, that such hemorrhages should be looked for at necropsies. He emphasizes that in case of occult or manifest melena, particularly if it concurs with epigastric colics and if no source of hemorrhage can be found in the gastro-intestinal tract (absence of enteritis and negative roentgenogram of the gastro-intestinal tract), the possibility of a carcinoma of the caudal portion of the pancreas should be taken into consideration and an exploratory laparotomy should be made.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 173-256 (Jan. 8) 1938

Asphyxia Neonatorum. J. C. Beker.—p. 174.
Dermoid Cyst of Floor of Mouth. B. W. L. Siemens.—p. 179.
*Catamnestic Data on Schizophrenic Patients Who Have Undergone Shock Therapy. A. Querido and P. A. F. van der Spek.—p. 184.
Results of Psychoanalytic Treatment. J. H. van der Hoop.—p. 190.

Schizophrenia After Shock Therapy.—Querido and van der Spek report observations in the after-care of schizophrenic patients who have undergone shock therapy. They give tabular reports of their observations in nineteen cases, listing the age of the patients, the symptoms before the treatment, the type of shock therapy used (insulin or metrazol injections or the combined use of the two substances) and the mental and physical status after the treatment. Regarding the mental status, the authors say that in most patients inactivity and lack of initiative predominate. Moreover, in many the shock therapy is at first followed by a mild depressive period. When reestablished in their social surroundings, the patients show a behavior which indicates that in general the essential schizophrenic symptoms have not disappeared. It is understandable that the psychiatrists at the clinic in the beginning are satisfied with the results of the shock therapy, for the majority of the schizophrenic symptoms, such as hallucinations, illusions, anxieties and motor unrest, disappear. The patient becomes apparently social. However, this improvement is only apparent; it is followed by a wavering attitude, lack of activity and lack of initiative; that is, the patient is not more social but merely more submissive; and particularly the lack of those characteristics which in the beginning simulated cure lead to the disappointment of the optimistic expectations.

Hospitalstidende, Copenhagen

80: 1357-1380 (Dec. 28) 1937

*Prognosis of Recent Cavity on Conservative Treatment. S. Cold.—p. 1357.

Prognosis of Recent Cavities on Conservative Treatment.—In nineteen (40 per cent) of forty-eight cases of recent cavities in which ordinary sanatorium treatment was administered and which were observed for seven years or more Cold reports good results, and in twenty-nine (60 per cent) poor results. Women, especially young women, predominated in his material. He says that the prognosis seems the same for the two sexes and independent of the localization of the cavity within the lung, or whether in the right or the left lung. The results were more favorable in the twenty-seven cases of unknown source of infection than in the twenty-one with a known possible source of infection, in which exposure to more massive infection was presumably greater. In fifteen of the nineteen cases, in which the condition was nonbacillary at the end of treatment, and in only two of the twenty-five cases in which the condition was bacillary more than a year, late results were good. The course was unfavorable in patients having fever for more than two months. A comparison between the forty-eight cases of recent cavities and twenty-nine cases of more chronic cavernous phthisis of corresponding extent from the same period in which conservative treatment was also given and observed for seven years showed that patients who died or patients transferred for collapse treatment numbered 50 per cent of the first group and between 75 and 80 per cent of the second group.

Ugeskrift for Læger, Copenhagen

100: 1-28 (Jan. 6) 1938

*Treatment of Acute Nephritis. C. Holten.—p. 1.
Features of Clinic of Endometriosis. C. Aaberg.—p. 6.
Seasonal Variations of Cevitamic Acid in Serum. E. Trier.—p. 10.
Weil's Disease Without Cardinal Symptoms. I. Knudsen.—p. 14.

Acute Nephritis.—Holten says that rest in bed is the best means for avoiding the greatest danger that threatens the patient with acute nephritis; namely, chronic nephritis. His principle is to keep the patient with acute hemorrhagic nephritis in bed until the urine is free from albumin and until ordinary careful microscopic examination made at least twice at a week's interval shows the urine to be without erythrocytes; a further requirement is that the creatinine test shows normal renal function. He believes that in by far the largest number of cases recovery is possible if the patient is admitted early in the disease and kept in bed as stated. He asserts that recovery is possible even if the erythrocyturia persists for more than three months, as long as sedimentation and function tests disclose a tendency to improvement. By "recovery" he means that at least one-half year after discharge the urine is chemically normal on several examinations or chemically and microscopically normal on one examination. Of his fifty-two patients treated from 1932 to May 1937, including twenty-seven children under the age of 15 years, forty-one are well, three have rest albuminuria, three have chronic nephritis, two are dead from exophthalmic goiter and anuria, respectively, and information is incomplete in three. He feels that there is a sure occurrence of recovery of about 75 per cent. Six of his patients were kept in bed for from 115 to 175 days: after-examination in five from nine months to four years after treatment ended showed them to be well, while the sixth, discharged in April 1937, had not yet been examined; all but one of these patients were admitted for treatment less than two weeks after the beginning of the nephritis; one had been ill for five weeks. In the three cases of recurrence, repeated bed treatment resulted in recovery in eleven, thirty-eight and sixty days, respectively. The average length of hospitalization for the successfully treated patients was about eighty-four days, the minimum twenty-one days and the maximum 200 days. Of the chronic cases, treatment had first been given at home for five months in two and discharge after one month was requested in the third. Of the patients with rest albumin, two had been sick at home for three and seven months, respectively, and were not free from erythrocyturia after ninety-eight and twenty-five days; one was treated for only two weeks.

V 1
193